FOUNDED, 1904

The Far Eastern Review

ENGINEERING + FINANCE + COMMERCE

THE PIONEER IN ITS FIELD

A Monthly Review of Far Eastern Trade, Finance and Engineering, Dedicated to the Industrial Development and Advancement of Trade in Far Eastern Countries.

HEAD OFFICE: 5 JINKEE ROAD - - - - SHANGHAI, CHINA.
George Bronson Rea, *Editor and Publisher*
William Carter Rea, *Advertising Manager*

NEW YORK: British and Colonial Press, Inc.,
738 The Knickerbocker Building, Broadway and 42nd Street.

MANILA OFFICE: Fleming, Percy Smith and Seth,
Roxas Building, Escolta.

CHICAGO: British and Colonial Press, Inc.,
140 Dearborn St.

GREAT BRITAIN: Walter Judd, Ltd., 97 Gresham Street Bank,
London, E.C.

SAN FRANCISCO: Leroy P. Boyce, Monadnock Building

SUBSCRIPTION IN CHINA: $10.00 Mexican, Elsewhere Gold $5.00 per annum

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Entered at the U.S. Postal Agency, Shanghai, China, as second-class matter. Registered at the Chinese Post Office as a Newspaper. Entered at the Japanese Post Office as a Newspaper.

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THE PACIFIC CONFERENCE
CHINA'S VICTORY
Japan's Brilliant Come-Back

FAR EASTERN HARBORS
SHANGHAI
NEWCHWANG
SINGAPORE
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FORMOSAN SUGAR INDUSTRY

INDO-CHINA RAILWAYS
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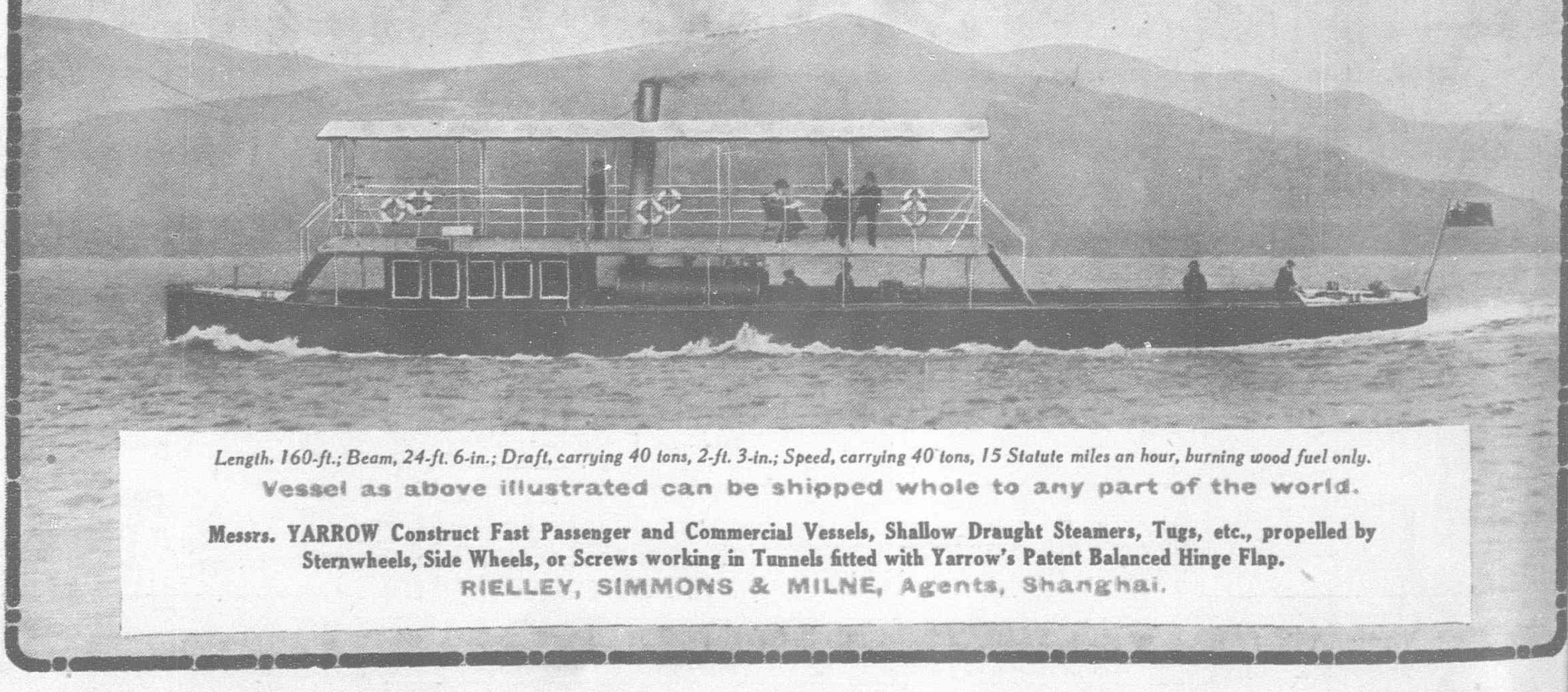

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The Far Eastern Review

ENGINEERING FINANCE COMMERCE

VOL. XVIII SHANGHAI, FEBRUARY, 1922 No. 2

SIDELIGHTS ON THE CONFERENCE

TWO years ago, America rejected the League of Nations, spurned a tripartite alliance for guaranteeing the safety of France against possible future German aggression, and to-day accepts a four power treaty embracing the essence and principles of the Wilsonian league, with an Article Ten thrown in, to cover the Pacific insular possessions of the signatory powers. We refused to ratify an alliance which compromised us to come to the aid of France and then invited the latter to enter into an agreement which guaranteed our possessions in the Pacific, providing the opportunity for M. Viviani (heading the French delegation at Washington) to remark, "France will assume all of the obligations that fall upon her in the treaty. France has never declined to stand by her plighted word. When there has been a question of standing by her plighted word or taking up arms, France has never hesitated."

The four-power treaty comes to supersede the Anglo-Japanese alliance and brings the United States into a miniature Far Eastern League of Nations which takes on the character of an alliance for the protection of island possessions in the Pacific. There is little difference between Clause Two of the new treaty

THE NEW PACIFIC TREATY

I.

The high contracting parties agree as between themselves to respect their rights in relation to their insular possessions and insular dominions in the region of the Pacific Ocean.

If there should develop between any of the high contracting parties a controversy arising out of any Pacific question and involving their said rights which is not satisfactorily settled by diplomacy and is likely to affect the harmonious accord now happily subsisting between them, they shall invite the other high contracting parties to a joint conference to which the whole subject will be referred for consideration and adjustment.

II.

If the said rights are threatened by the aggressive action of any other power, the high contracting parties shall communicate with one another fully and frankly in order to arrive at an understanding as to the most efficient measures to be taken, jointly or separately, to meet the exigencies of the particular situation.

III.

This treaty shall remain in force for ten years from the time it shall take effect, and after the expiration of said period it shall continue to be in force subject to the right of any of the high contracting parties to terminate it upon twelve months' notice.

IV.

This treaty shall be ratified as soon as possible in accordance with the constitutional methods of the high contracting parties and shall take effect on the deposit of ratifications, which shall take place at Washington, and thereupon the agreement between Great Britain and Japan, which was concluded at London on July 13, 1911, shall terminate. The Government of the United States will transmit to all the signatory powers a certified copy of the proces-verbal of the deposit of ratifications.

The present treaty, in French and in English, shall remain deposited in the archives of the Government of the United States, and duly certified copies thereof will be transmitted by that Government to each of the signatory powers.

The following provisions are in the form of a separate agreement signed at the same time:

In signing the treaty this day between the United States of America, the British Empire, France and Japan it is declared to be the understanding and intent of the signatory powers:

1. That the treaty shall apply to the mandated islands in the Pacific Ocean; provided, however, that the making of the treaty shall not be deemed to be an assent on the part of the United States of America to the mandates and shall not preclude agreements between the United States of America and the mandatory powers respectively in relation to the mandated islands.

2. That the controversies to which the second paragraph of Article I. refers shall not be taken to embrace questions which, according to principles of international law, lie exclusively within the domestic jurisdiction of the respective powers.

Washington, December 13, 1921.

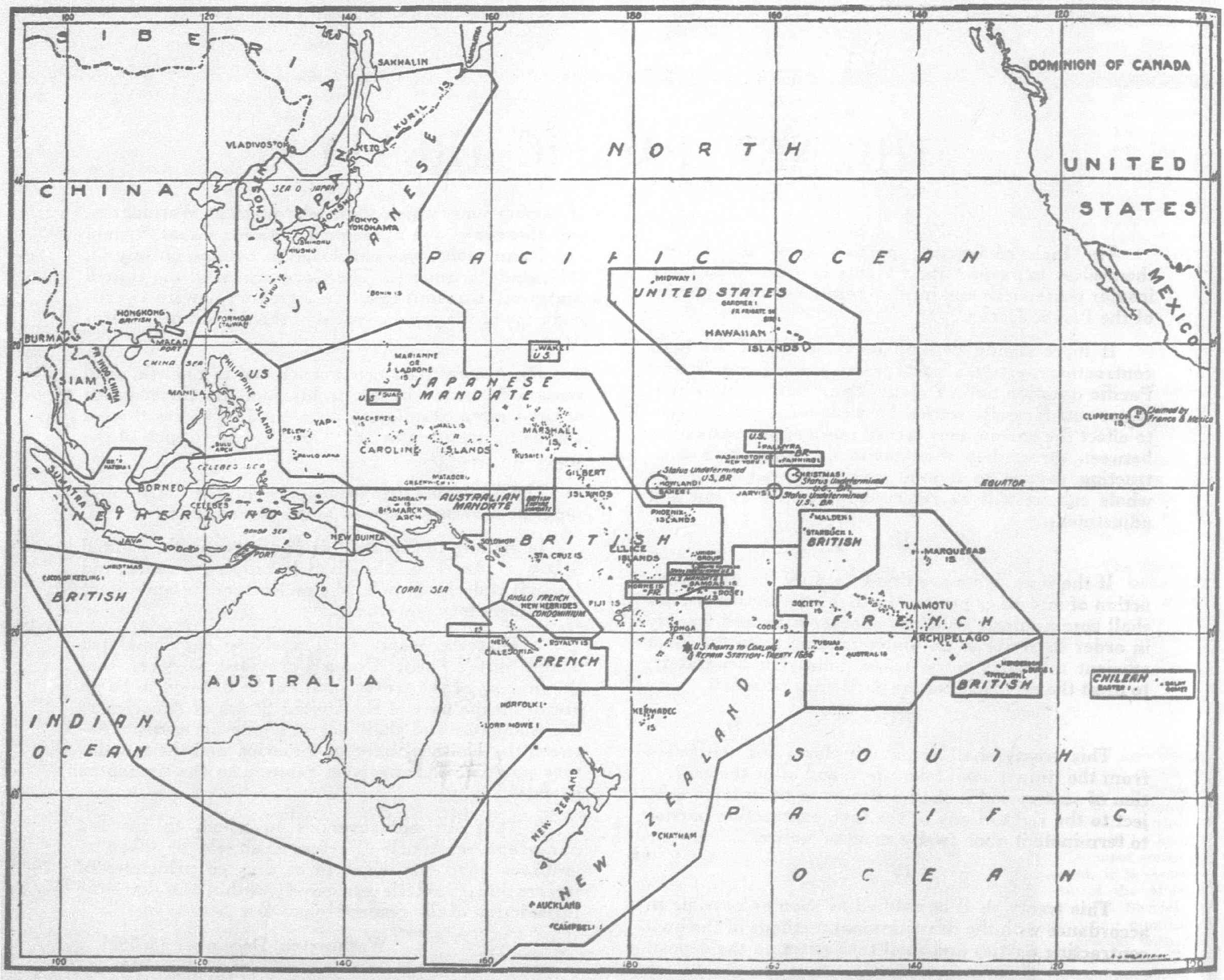
and Article Ten of the League of Nations which expressly undertakes to guarantee the territory of its members against external aggression, but in regard to doing this it provides : "In case of any such aggression or in case of any threat or danger of such aggression, the council shall advise upon the means by which this objection shall be fulfilled."

The difference between the two is slight, and, in effect, the Pacific treaty is one of alliance with teeth in it, which is as it should be, if it is to carry out its purpose. America has come out of her seclusion, and entered upon a new world career which makes us a partner of Japan in upholding the peace of the Pacific and confirming each power in its possession and enjoyment of lands now held by them under mandate or in trust for their lawful owners.

As was to be expected, the treaty has re-opened the partisan feeling that characterized the fight over the League of Nations, with the republicans standing behind a jubilant administration and the democrats waiting for the phychological moment to spread consternation amongst the merry-makers. The fact that the treaty has the full support of those who killed the Versailles treaty goes to show that the real reason why the latter was blocked by the Lodge forces in the senate was simply because it was proposed by a democratic administration, and the republicans slaughtered it "to get even with Wilson." Wilson's friends are keeping quiet, and, although there are indications that an effort will be made on the part of the democratic leaders to block the treaty, their tactics will tend more to holding up the republican party to the ridicule of the nation for its partisan politics in defeating the Versailles treaty. The leading democratic papers concede that it meets with the general approval of the country, and is accepted as a belated republican indorsement of the League of Nations, leading in the near future to American membership in the league, and so vindicating their leader and furnishing the democratic party with campaign material for the next presidential elections. The irreconcilables headed by Senator Reed of Missouri can be depended upon to fight ratification of the treaty. Borah is keeping silent. Johnson's attitude has not been disclosed and La Follete can usually be depended upon to fight anything.

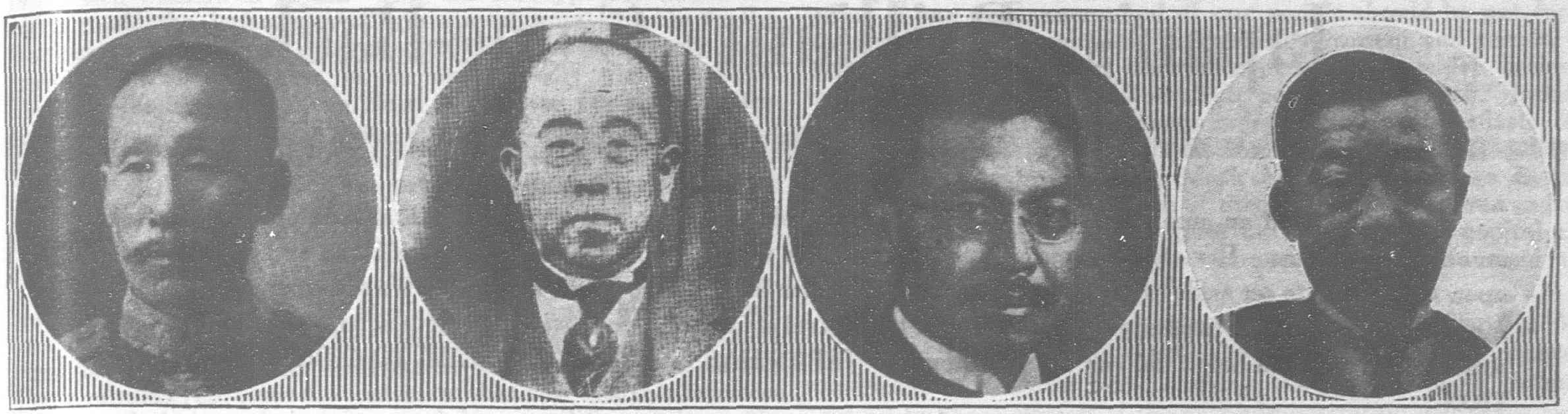
On the other hand, the Democratic *Brooklyn Eagle* warns us that "we are in for a fight on the treaty. One of the chief arguments which will be offered against it is that there are certain points of doubt as to just what it includes or involves." Indications are that an attempt may be made by friends of China to kill the treaty in the same way they assisted in hamstringing the Versailles treaty, simply because of a feeling that Japan has come out of the conference with greater power and prestige than when she went in, and that China's rights have not been sufficiently restored. It

MAP OF THE PACIFIC UNDER FOUR-POWER TREATY



This Map Shows in Outline the Mandates, Claims and Sovereignties as Considered by the Disarmament Conference in Framing the Four-Power Treaty, and It Also Illustrates Problems Faced in the Future Settlement of Various Contentions. The Former German Possessions Are Within the Inclosures of the Japanese, the Australian and the New Zealand Mandate. *(New York Times)*

JAPAN'S DELEGATION AT WASHINGTON



Admiral Kato Prince Tokugawa Ambassador Shidehara Vice-Minister Hanihara

is needless, however, to say that any such tactics will lose for China the friendship of the other powers and lay her open to the renewed charge of being an obstacle to peace. "A people incompetent to run their own affairs should be very careful about intervening in the affairs of other strong, well equipped nations who have been brought to the verge of war by the inability of China to govern herself and preserve neutrality or sovereignty."

> "Two months ago," writes Frank H. Simonds in the *Review of Reviews*, "I told my readers that there was every sign that the United States and Japan were drifting toward war in the Far East. Since Chinese conditions are what they are, it would be rash to forecast that all danger has been removed, but at the least all apparent danger has been eliminated and the mutual misunderstandings and apprehensions of the two nations have been enormously reduced if they have not been finally banished. If this were the sum total of achievement of the Washington conference it would still justify the wisdom of the president in calling it and testify to the loyal service of all who participated in it."

The consensus of American opinion favors the treaty as a splendid conception, removing all sorts of causes for serious disputes, a base upon which may and should be founded a far more extensive co-operation. The fact is generally acclaimed that the president and Secretary Hughes have worked out a plan that will insure peace and lighten the intolerable tax burdens of a suffering and impoverished people and opinion is strong that the treaty should be ratified promptly and obstructionists swept out of the path. What happened two years ago, will not be tolerated at the present time.

When it was discovered that the four-power treaty extended over the Japanese homeland according to a private agreement made by the American delegates, the only reasonable inference was that Japan had exacted this guaranty as the price of scrapping the Anglo-Japanese alliance, which provided the enemies of Japan with the opportunity of charging her with descending to trading tactics. But, as the *New York World*, declares, "nothing more extraordinary has come out of the Washington conference than the report that the Japanese object to the guarantees of the four-power treaty and are asking that Japan proper be excluded from its provisions."

With the final ratification of the four-power treaty the old Anglo-Japanese pact will automatically fall into the discard. Everybody should be satisfied to this outcome of a most distressing situation. Great Britain lives up to her traditional reputation for playing the game, standing fairly by her ally until a new and stronger instrument takes over her obligations. The pressure upon Britain last year to terminate the alliance and isolate Japan was tremendous. Condemned by her Pacific dominions, appealed to by America and villified by China for the existence of an alliance which had carried Japan to the point where she was considered a menace, the attitude of the British government throughout has been one that compels admiration for the generous, whole-hearted manner in which she stood by her partner. For this was the real crux of the conference, the pivot around which all the minor questions revolved. Japan went to the conference in fear and doubt with the menace of isolation and relegation to the rank of a second rate power staring her in the face. The tirades of the anti-alliance party in England, the thunderings of Northcliffe and his satellites, the clamor in America and the strenuous propaganda of China created a public opinion before which a weak British government might have bowed and condemned Japan to face the world alone. British opinion as a whole, however, was not influenced by the vigorous campaign to isolate Japan, and as typical of the general attitude on the question, the *Dundee Courier* says:

> "Japan, on the other hand, has many coincidences of circumstance and interest with the British empire. She, too, is an island kingdom, and she proved a faithful and powerful ally in the war. These are facts which must be remembered when there is easy talk about cancelling the alliance. What are we to put in its place? A vague assurance of friendship from the American government of the day?
>
> "There must be something more solid than that. If America can give a definite guarantee, well and good. If Britain, America and Japan can forge a triple alliance that would be best of all."

That Japan emerges from the conference stronger than ever is due largely to the fidelity and honor of her ally. Japan's place as a first class power, one of the Big Four, is now assured to her.

True, the new pact cannot be called a substitute for the old alliance which gave specific guarantees. Disagreements between the contracting parties are to be brought before a joint conference of four. It is, as Mr. Frank H. Simonds points out in the *Review of Reviews*, a guarantee of the *status quo*, but not a guarantee to maintain it by our force, but by our good behavior--just that and nothing more." The difference in the two treaties as explained by Mr. Hanihara, "was the difference between whisky and water," but such as it is, it is accepted by the Japanese as constituting a promise which is to take the place of the Anglo-Japanese alliance.

As the elimination of the old alliance was one of the primary objects of the conference, Americans must remain content and accept the responsibilities and obligations which the new line-up places upon us. We willed it so. It was our party. We must play the game and not cry baby, as we did after Paris. China is not satisfied. Her publicists are crying to heaven that they have been betrayed, that Japan is now in a stronger position than ever to work her will in Asia. This, notwithstanding that Japan has subscribed to all the committments upholding China's sovereignty, integrity and the "open door." It is difficult at times to understand just what the Chinese *do* want. Last year they sent their most able publicists to America and Europe to oppose an extension of the Anglo-Japanese alliance. They have succeeded. All credit must be given to them for the manner in which they presented China's side of the case. The British and American governments and British merchants in China menaced with a boycott perhaps will not endorse the methods employed in their campaign, but they did their duty as they saw it. Yet the Chinese are disappointed and criticize the weakness of their leaders and publicity methods. They are hard to satisfy. They wanted to isolate Japan and place her in the dock before the court of nations. They might have succeeded had it not been for Great Britain. China overplayed her hand, and while Britain accepted the necessity of terminating the pact, it was done in an honorable manner.

Japan's Brilliant Come-Back

Japan has had an amazing success in the Pacific conference and has come out with a rehabilitated reputation amongst Americans. Her chivalry and sense of justice have triumphed. She has met us half way and it now devolves upon Americans to set aside their prejudices and go the other half to clasp hands with her. We must co-operate with her morally and financially to strengthen the hands of the liberal element in Japan who talk the language that we understand. American capital can help. So can the government. JAPAN HAS EARNED THE RIGHT TO CORDIAL CO-OPERATION.

SUCH is the verdict of America as expressed by her leading newspapers. Such is the answer of the United States to the campaign that has been waged for the past two years to incite hostilities. Such is the real reaction of the country which has been concealed from the people of the Far East by the mass of anti-Japanese correspondence and literature disseminated from Washington by interested parties. "Japan astonished the Americans with her spirit of give and take and a readiness to meet us more than half way on all essential points," says the *New York Herald*, who led the attack upon Japan at the opening of the conference through the articles of Mr. Louis Seibold. The *Herald* goes further and testifies that "Japan has greatly surprised public opinion by the large view she has taken of all matters and by her readiness to co-operate with other nations in the interest of world betterment." In the matter of the *Mutso*, the same paper adds, "Japan had met the other delegates of the conference in so fair a spirit and on so many points that it was amply due her that in the circumstances they should meet her in this matter of profound national objection to the destruction of the *Mutso*." The *New York Herald* has lived up to its grand traditions in so frankly and quickly counteracting editorially the wrong impressions created through its reading columns.

The *Newark Star* gives perhaps the best composite idea of the reaction of the country as a whole on Japan and her policies. It says:

> "It was Japan who was expected to throw emery powder into the works of the Washington conference, if any were thrown. It was Japan who was feared as the proposer of jokers, the spinner of intrigue, the smooth and wily trickster—far too clever for American and European diplomatists—who would prove this huge show to be a comedy.
>
> "To date, Japan has been everything it was feared she would not be. Her request for a modification of the Hughes' naval disarmament program involves just one warship. She has not balked or been sullen over the discussions of the Far East questions.
>
> "Just as the Japanese delegates have been eager to accept the principle of the 'open door' so have they committed their government to other policies warranted to prevent friction in the Pacific. Japan at Washington is quite another country than the Japan at Versailles.
>
> "It is doubtless true that Japan is forced into a position of fair-dealing and concession. She cannot pursue an individualistic course in the Far East. She has hoped and worked for the support of Britain as against the United States. Britain elects to do at the Washington conference as America does. Japan promptly swallows disappointment and falls in line.
>
> "But forced to give way or not, Japan has done it gracefully. Unless she reverses her present tactics she will come out of this conference with a rehabilitated reputation among Americans."

The correspondent of the *London Daily Chronicle* says that—

> "It must be admitted that so far Japan has had amazing success in this conference. The quadruple treaty speaks for itself. Japan came to Washington with many misgivings. Her chief fear was of isolation, in other words, loss of the English alliance with nothing of much value as a substitute. What she now receives is much wider in scope—a mutual pledge by big Pacific powers that makes the ocean in which the island empire is situated absolutely safe. The agreement not to fortify islands puts the final seal on Japan's security: she may now rest in placid confidence behind an impenetrable strategic shield of from 4,000 to 8,000 miles of navally untraversable ocean."

The *Wheeling (W. Va.) Register*, one of the first American papers to note the change in popular sentiment, said:

> "The Japanese bugaboo appears about ready to collapse. It has served well the purpose for which it was created (spurring America on to greater and greater war preparations for the benefit of corpulent armament builders and munition makers), but it is now doomed for the ash can where it has long belonged, and much because of the attitude taken by the Japanese delegates at the disarmament conference."

The position of Japan is also ably outlined by the *Rochester Post Express*, which says:

> "That Japan is an intensely ambitious nation cannot be denied. But the Japanese are a people capable of adapting themselves to every change of circumstances. Their demands on China have been abated because they realized that justice necessitated concessions to their Chinese neighbors.
>
> "No longer does Japan insist on her twenty-one demands. She puts generosity above self-interest. China is unprogressive. Japan is progressive. But those who suspected that Japan desires to rob China were utterly wrong.
>
> "The negotiations between these two great nations of the Far East have resulted in an expression of willingness by Japan to transfer the Shantung railway to China on certain equitable terms. With regard to other nations Japan favors the 'open door' in China. She has become the ally of the United States against whom she was supposed to be meditating war.
>
> "If her militarists had an aggressive policy, the true Japan has discarded it, and freely entered into the brotherhood of nations.
>
> "Let us, then, honor Japan as a heroic nation whose chivalry and sense of justice have triumphed over those selfish instincts from which neither men nor nations are free."

Mr. Elmer Davis, special correspondent of the *New York Times*, writes:

> "Washington has taken a liking to most of its guests at the conference, even if not all the guests have taken a liking to Washington. Perhaps, if any one of the delegations has made a more favorable impression than the others, the honor would have to be given to the Japanese, whose representatives have been—as Japanese representatives abroad usually are—admirable examplars of the old culture of Japan, living proof that it can be combined with practical modern qualities without suffering deterioration."

The *Philadelphia Record* supplements the above as follows:

> "Japan balks at restoring Port Arthur to China, and if Hongkong is left with England, Japan might keep the position which it has captured twice, the second time from Russia at a cost of 22,000 men. Japanese interest in this place is not wholly sentimental. China is not strong enough to hold the point, and an enemy at Port Arthur would be a great danger to Japan. We probably know now why Japan insisted on 70 instead of 60 per cent. of capital ships. It can recede from that position in consideration of being allowed to keep Port Arthur. *If China can get back Weihaiwei, Tsingtao and Kwangchow without cost and without an effort it will be a sufficient triumph for Oriental diplomacy.*"

Without a dissenting voice British journalists at the conference bear willing testimony to the brilliant success of Japan. At no point has she been open to the criticism of playing a double game. To sum up, the re-action of sober-minded America on Japan as opposed to the professional jingoes and trouble breeders, is best set forth in the following eulogy appearing in the January number of *World's Work*:—

"The Japanese delegates at the conference have been a delight to the well-wishers of Japan. They have dropped the reticence which made the Japanese at Paris almost unintelligible to the Western understanding. Now that they have spoken freely, their conversation reveals them in an unexpectedly pleasant light. They talk the language of the West, and, better yet, they talk the language of Western liberalism. No mere facility in the use of the catch-words of democracy could for weeks on end conceal an ignorance of the realities of the subject matter. These Japanese have really grasped the philosophy of Western ideals as we know them.

"Their presence here as the plenipotentiaries of Japan is profoundly significant. Premier Hara doubtless knew his men when he chose them, and Premier Takahashi doubtless knew them when he confirmed their warrant to act for his government. They doubtless represent the sentiment that now controls Japanese policy—and that sentiment is certainly very different from the feelings which controlled the government of Japan four years ago.

"Events in Japan indicate a silent revolution in that country of the most far-reaching importance. The accession of Hirohito to the regency brings to the throne the first ruler of Japan who has traveled in the West and been educated in Western ideas. That accession was apparently timed to be significant at the moment when America, Great Britain and Japan were composing their differences in Asia. It is coincident with studied announcements of the retirement of the two of the three living elder statesmen who represent the ideas of German origin upon which the constitution of Japan was built. Unless evidence that has a striking unanimity of character is pure coincidence, Japan is giving notice to the world of a new tack that will bring her morally into the front rank of modern nations. Apparently she has made the great decision—that she will compete with the world hereafter in a generous rivalry of fair play and in an emulation of the best practices of advanced democracy.

"This is a golden opportunity for America to further the cause of civilization. The way to do it is to meet Japan half-way. Every effort of our government and of our people should be put forth to establish contact with the Japanese government and people, to strengthen the hands of that element in Japan which believes with us in the doctrines of liberalism, peace and concord. Japan's new attitude must pay dividends in Japan, or it will not last. We must co-operate to the end that it shall be so profitable that it cannot be overthrown. Mr. Mark Sullivan, elsewhere in this magazine, has indicated some of the ways in which, even individually, we can improve the opportunity. American capital can likewise help. So can the government. Japan has earned the right to cordial co-operation."

In these words the great magazine owned in part by Mr. Walter H. Page, ex-ambassador to Great Britain and stalwart supporter of Woodrow Wilson, undoes the propaganda so viciously spread by those officials of the past administration who have been foremost in impugning the good faith of Japan in order to distract attention from their own diplomatic shortcomings. It has been clear for the past two years that a great change was taking place in Japan, that her business men, bankers and merchants were more and more dictating the policy of the government, a policy that has for its ultimate goal co-operation and harmony with America and whole-hearted friendship for China. THE FAR EASTERN REVIEW has held steadfast to its faith in the good intentions of this element and supported the campaign for better relations and a peaceful solution to our national misunderstandings. Japan has played the game squarely and fairly. She has met us on all points. She has earned the right to our respect and cordial co-operation. Her friendship is our best asset in the Pacific. The conference has ushered in a new era, which finds us allied to Japan for maintaining the peace of the Pacific, a pact in which she will ungrudgingly carry her full share, irrespective of what it may cost.

China's Victory

JAPAN'S brilliant success at Washington is equalled, if not surpassed, by the great moral victory scored by China. Never before in the history of the world (perhaps never to be witnessed again) has a bankrupt, chaotic and hopelessly disorganized government received such consideration, such courtesy, such assurances of friendship and desire to assist it as did that of China at Washington. The treatment accorded the Chinese stands unparalled in history and the names of Sze, Koo and Wang will be honored for their heroic fight against the most tremendous handicaps ever faced by the plenipotentiaries of any nation. They stood pitted against the strongest diplomats and minds of the day, with nothing behind them but the moral force of their appeal. They represented a government unworthy of the name, one admittedly incompetent to carry out any committments that may have been entered into on its behalf. Their voice carried no weight, no authority; they were beggars before the court of world justice.

The *New York Journal of Commerce* described the situation succinctly when it declared that

> "all that can possibly be demanded of the powers by the government of China to-day, is to recognize it as a going concern. To assume its ability to discharge any international responsibilities that might be accepted on its behalf is to predicate for it a length of life to which it cannot aspire. Confessedly, the government of Peking is bankrupt, it has defaulted on its debt payments: it can pay no salaries to those in its employ, and even the expenses of the delegation in Washington are being paid, according to the best information available, out of a fund subscribed by Chinese merchants abroad."

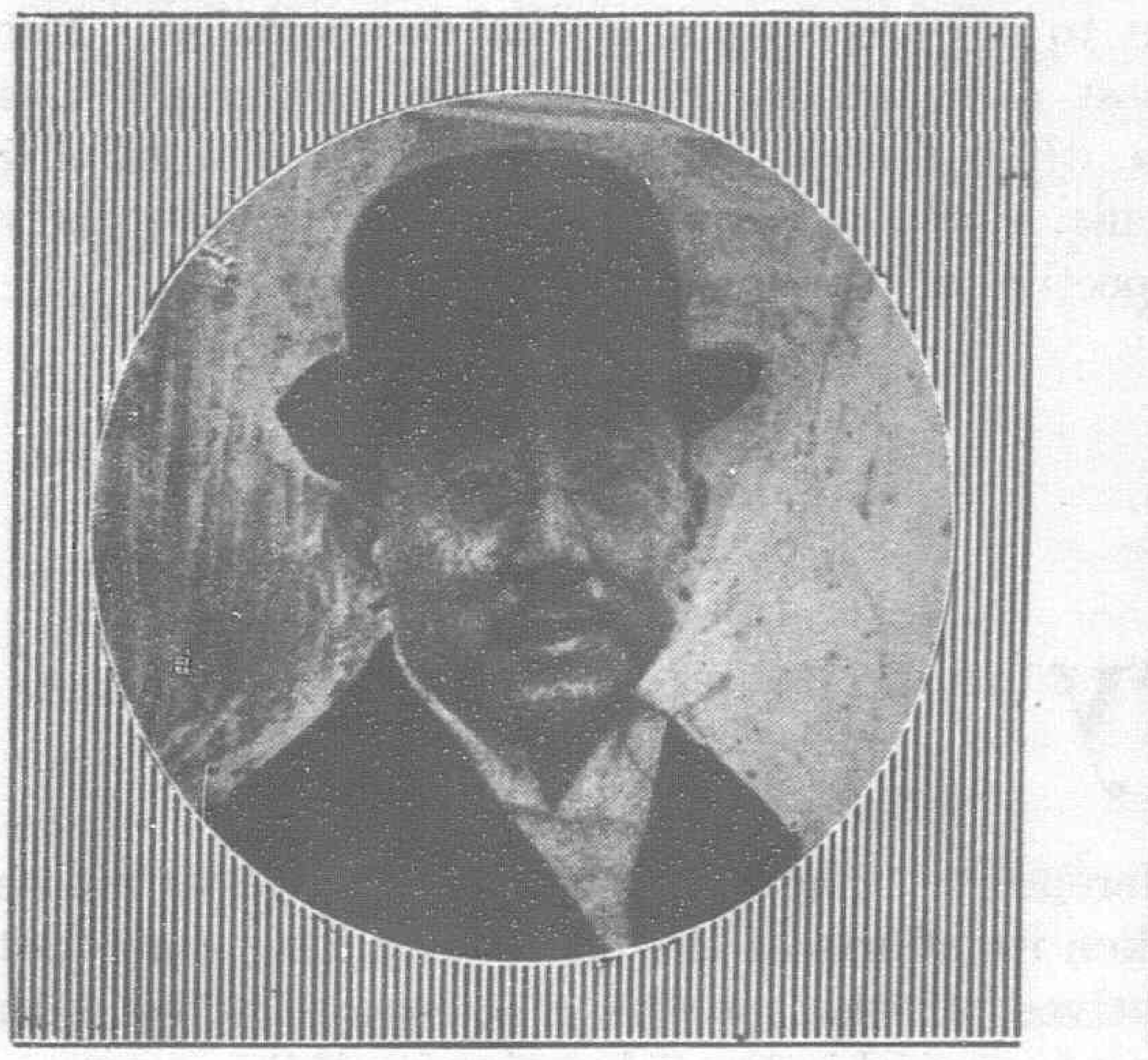
The three official representatives of China not only labored under these tremendous handicaps, but their position and efforts were made more trying, more difficult, by the constant interference of the swarm of unofficial delegates who sought to impose their views upon the conference. "The attempts to disrupt the Chinese delegation and weaken its efforts at the conference have come not from the representatives of other powers who have differed with China's proposals, but from within the delegation itself."

Mr. Junius B. Wood, the able correspondent of the *Chicago Daily News*, tells us that these inside differences arose when united action and harmony were most needed in the difficult negotiations. Even Dr. Tsao, who resigned as chief secretary of the Chinese Delegation because he felt that China was not receiving a square deal, had his ire aroused at the anonymous interviews given out by "unofficial delegates" questioning the consistency of the policy which Secretary Hughes had followed in regard to China.

> "As long as the three delegates are here representing our government," said Dr. Tsao, "they alone can express the policies of the delegation or have the right to comment on the work of the conference. If one of several of our advisers or secretaries quit, that is purely a private affair of our delegation. Mr. Briand, who was the chairman of the French delegation, went home, but that did not change the status of the delegation in the conference. A changing of advisers certainly cannot do so. That is happening with regularity in all the delegations.
>
> "That these advisers should criticize the work of their delegates or of other persons in the conference is both premature and in bad taste. At the most it is not entitled to any more weight than an expression of their personal opinions, not an official opinion of China, which can come only from the three delegates.
>
> "There certainly is no basis for any charge that Mr. Hughes has weakened in his efforts to secure justice for China. No such feeling is entertained by us. We realize that he has done so much for us, and it is too early to express either gratification or disapproval of the final decisions of the conference, which still are a long way off."
>
> "The complaints about the policy of the Chinese delegation and about the treatment it has received from delegates of other countries have not been limited to public interviews," adds Mr. Wood. "Numerous Chinese have called on members of other delegations, pouring out their real or fancied troubles, and creating an impression in many quarters that the delegation itself is cantankerous and inclined not to be satisfied with anything."

The attempts of these so-called people's delegates working with the Chinese students and other organizations in the United States to intimidate the official representatives, together with the untiring propaganda of Dr. Ma Soo, the Canton delegate at Washington, to discredit the Peking government and wash China's dirty linen at the conference, provided Washington and the world an object lesson of the rivalries and disorganization in China's domestic affairs. Chinese publicists, students at colleges, unheard of before the conference as writers or experts on their own problems, deluged the press with copy, all emphasizing that China would not be bound by the terms of the Versailles treaty and that the Shantung question would have to be thrashed out in full conference. Various unofficial programs were presented to the newspapers as the irreducible minimum of China's demands, all intensely patriotic, but all losing sight of the one great fact that China is unable to maintain or guarantee her sovereignty. This divergence of views, lack of organization and program, and squabbling amongst themselves more than anything else, helped to convince the conference that China was as yet in no position to be entrusted with the full management of her own affairs.

CHINA'S STANDARD BEARERS AT WASHINGTON



Alfred Sze

Wang Chung-hui

Wellington Koo

China at Washington stood revealed to the world in all her "make believe," striving desperately to "save face" by ignoring facts. It laid her open to such bitter criticism that her people should be convinced of the precarious position they hold in world affairs. In the face of existing conditions her delegates sought to impress upon the conference that China stands upon "the same plane in respect of law and justice as do the most advanced and most intelligent of Western states." Especially was this so in Minister Sze's admirable presentation of China's case and her demands for an immediate release from all impairments and limitations upon the "autonomous, unembarassed exercise of her territorial administrative powers." Which influenced *The Times (London)* to call him to earth in the following terms:—

"The arguments by which the Chinese delegate supported his fresh demands were skilfully adapted to the minds of Western democracies, who fondly believe that a government represented by so plausible a speaker must in all that is essential resemble their own. This effort to establish that all his new demands are the inevitable consequences of principles which the committee have adopted, and that the members cannot reject them without stultifying themselves, was framed and pressed with an adroit perception of popular ignorance and of popular sentimentality that does him infinite credit, and the way in which he introduced the question of Manchuria is dexterous. But the part of his speech in which he surpassed himself was in his grave appeal to his colleagues on the commission to reflect what their feelings would be were encroachments like those of which he complained made upon the sovereignty of their own countries." "Your feelings of justice and your sense of the dignity due to your State," he told the representatives of the United States, of England and of Japan, "would in such a contingency make evident the propriety of a claim such as China now advances. The rights of exclusive territorial jurisdiction, in international law and in the general sense of international comity and justice, manifestly attach to the status of sovereignty and independence. Yet these rights are being infringed in the case of China. Nothing could be more plausible, and nothing, as many of Mr. Sze's hearers knew, and as he knew they knew, could be more hollow and more misleading. We have seen the strength of Chinese statecraft; here is its weakness. It has an implicit faith in the virtues of "make see," and accordingly the Chinese delegate claims to the representatives of the Pacific powers, well acquainted with the truth, that China stands upon the same plane in respect of law and justice as do the most advanced and most intelligent of Western states. The ingenuousness with which he assumes that an imposture so palpable can pass muster is almost touching—especially when he hnows that not all the artifices and obstruction of his government can prevent the proposed commission of enquiry from letting in the harsh light of day upon the fiction."

After a scathing criticism of Japan's former policy in China and recognizing the change that has taken place as the result of a new outlook on the future of the empire, the *Birmingham (England) Post* scores China in the following words:—

"The real obstacle to a harmonious settlement is one not foreseen by most people—the attitude of China, one absolutely inconsistent with existing facts and with any possible settlement. China came to the conference as an injured party, wronged by Japan. She is there now, in opposition to Britain if not to America, claiming the consideration and aid needed by a weak nation and the rights and privileges of a strong one. Unless she can be persuaded to change her position, it seems to us impossible for the conference powers to assist her. In that case she will go on to disaster and partition—partition by her own warring elements if not by outsiders. If that catastrophe should occur, then Japan may conceivably revent to her old policy. But to-day she is, we believe, desirous to follow the new one. And so, despite Mr. Koo and his preposterous assumptions and claims, the situation is still not beyond hope."

This is taken up by the *South Wales (Cardiff) News*, who calls attention to the notorious weakness and corruption of the Peking government, the inability of the people to maintain their national independence and the handing over of the country to the freebooting tuchuns which show

"that the Chinese representatives at Washington have a dubious status. They may speak for the Peking government, but it does not appear that the Canton government, or the general body of provincial governors, recognize them. They show also that even with the goodwill of the great powers it is a very moot point whether China is capable of governing herself. And a country in such a chronic state of weakness and disorder tends to become a prey to stronger powers, even though such powers may not desire to interfere in its affairs. We have to recognize the plain teaching of history, that as many wars have been caused by weakness as by strength. A government that cannot maintain law and order, and is acknowledged in only a small part of the territory over which it is supposed to rule, is a standing menace to itself, and a target for all its neighbors. This is the present condition of China, and were it to continue it would be extremely difficult for Japan and other powers to adopt the rôle of disinterested spectators."

In regard to Minister Sze's demands for the withdrawal of foreign troops from Chinese soil and the abolition of any and all impairments of China's sovereignty, the *Sussex Daily News (Brighton, England)* says:

"Acceptance of this demand would, of course, render any discussion of a Chinese settlement entirely superfluous; it would simply mean handing over the whole matter to China to decide. Whatever may be said of the abstract justice of such a course, it is clearly not a practical proposition. It would hardly be practicable even if China were a united and well governed country, and her delegates could claim to speak in the name of it. As things are, it is little short of preposterous. We trust that this resolution will promptly be dropped, and that the Chinese delegates will descend to the mundane plane of those realities which it is the business of the conference to discuss and, if possible, to adjust."

Lt.-Col. Repington, the military correspondent of *The Times*, lost his temper when it appeared that the Chinese delegates might resign or bolt the conference and sent the following dispatch to his paper :—

> "There is much talk of dissensions in the Chinese delegation and of the departure of some or all of the delegates from Washington. The world will not come to an end if they go nor will the work of this conference be deflected from its course, but it would be well for the Chinese to understand that they can only get what they want or are said to want by their supposed representatives when they re-establish order and create the services needed for an efficient administration. It will be only of disservice to China if the powers represented here leave China with confusion worse confounded."

The Morning Post (*London*) also scores the Chinese for their attempt to convert the conference into a clearing house for domestic politics and says :

> "The difficulty of dealing with the Chinese has again been demonstrated. Four of the most prominent advisers of the Chinese delegation have resigned and refused to have any further association with the conference. They give as a reason that their delegates are sacrificing the interests of China, and that Great Britain and the United States, instead of standing out for the protection of China against Japanese rapacity, have yielded everything to Japan and will leave her more strongly entrenched than ever. These are the assigned reasons, but the real reason, it is believed, is the struggle for supremacy between the so-called governments of the North and the South, and Washington is being made an arena of Cantonese and Pekingese intrigue.
>
> "The attitude of China is so unreasonable that she is rapidly losing all sympathy. There is a genuine desire on the part of all the powers to help China. Japan, from all accounts, has been reasonable and conciliatory, but China asks impossibilities and her pretensions are absurd. China has been given a golden opportunity at this conference and she does not recognize it."

It remained for the *New York Herald* to read the Chinese a friendly lesson as to American ideas on her welfare, and clinch the many criticisms of other prominent newspapers in England and the United States. The *Herald* places the facts fairly before China in the following terms :—

> "Not once or twice but many times this country has gone out of its way, far out of its way, in behalf of the interests of China. America is still the stanch friend of China. China is at the conference because of the insistence of America. America desires for China, and is diligent in seeking for China, the best and the most that can be achieved for her. But now, as for a long time, there are realities which must be faced by China, by America and by the world in working out the problem of China.
>
> "China wants control of her own transportation lines. She should have it when and where it is possible. She wants an end of exterritorial jurisdiction. Everybody hopes she will get it. She wants no international financial control. That were scarcely possible without her consent and voluntary co-operation. All the world as well as China herself wants to see her borders replaced where they belong and where they will no longer offer a temptation to swashbuckling imperialism.
>
> "But who is going to achieve this emancipation for China ? She admits, and her history shows, she cannot do it for herself. No one power, no two powers and no segregated groups of opposing powers can strike from her hands at one stroke the ties that bind her politically and economically.
>
> "China cannot control her transportation lines unless she finds a way to build them for herself. She cannot build them for herself unless she has the aid of outside capital, and this she cannot get while there is danger that the capital might not be repaid or that the railroad might pass into control of some foreign power.
>
> "China cannot abolish exterritorial jurisdiction until she has courts of her own capable of trying cases which involve foreign nationals. She cannot, to any good purpose, set up those courts until an agreement has been reached among the nations formerly enjoying exterritorial rights that they will abide by the decisions of the new tribunals.
>
> "China wants no international financial control ; she can escape it only by throwing off the old indifference as to how, by whom and for what purpose money shall be lent to her. She has been financed in geographical sections until there is neither head nor tail to her fiscal system."
>
> "If a conference in a foreign land were to discuss what was to be done about American courts, American railways and American finance we should of course regard it as insufferable, even if we were invited to send delegates. But in China's case no issue of propriety can be raised. She is, as she should be, represented at the Washington conference because the United States demanded that she should be represented there. China has more to say in this discussion than she has ever had to say in the private negotiations and international intrigues concerning her in the past.
>
> "All this will be considered by China and by the world as the conference tries to work out the solution of her problems."

It is with deep regret that Americans and British editors have been compelled to read the riot act to China who came into the conference of armed nations only because the United States willed it, so that her case might be aired and the causes of international strife removed. The conference was not a court for the trial of Japan. It was an effort on the part of the United States to find some way whereby the Anglo-Japanese alliance could be superseded by some workable instrument that would bring peace to the Pacific and in time stability to China. At all times China was the recipient of favors, and was, through American support placed in a strong position, brought face to face with all the nations interested in the Far East, with their representatives disposed to do everything possible to aid in restoring China's integrity and rehabilitate her finances. China unaided could never have brought about such a conference, and without the moral support of the United States could not have achieved what she did.

For the Chinese to even hint that they might bolt the conference, meant that it would throw upon the United States the task of acting as trustee for their affairs, placing us in a most embarassing position *vis-à-vis* the other powers. The attempt to override the Versailles Treaty relying upon America to stand by them, reflected little credit on the intelligence of those who demanded its reconsideration at the conference. The attempt to hold Japan up as a militarist nation, despite the many great concessions she was prepared to make to regain China's friendship, when persent day China is in the hands of the worst crew of freebooting militarists that has disgraced the pages of modern history, leaves a bad taste in the mouth. Japan's militarists exercised no influence on the conduct of their delegation at the conference. They, at least, have guided Japan to the front rank of world powers, while the militarists of China have deprived the country of its good name, its credit and standing, exposed it to the ridicule of the entire world, a suppliant for justice.

All honor then to Sze Chao-chi, of Cornell, to Koo Vi-kyuin of Colombia and Wang Chung-hui of Yale who stood alone reflecting the highest American and Western ideals of justice on behalf of a people whose rulers had no claim to a seat at a conference of the powers. They scored a success, a victory that their countrymen should be proud to honor them for. It is necessary to emphasize this, for already the vanguard of the disappointed ones are returning to China spreading the story that China has been betrayed, that the delegation has failed, that once more China has been humiliated and Japan lifted up to prominence.

If any defeat is to be registered, it is not China's official delegates who must stand the blame. The onus of failure must be borne by those responsible for China's defeat at Paris, those advisers and others, who enticed her to the highest pinnacle of hope only to dash her over the precipice and hurried home to justify their action by clamoring for war with Japan. The only failure registered at the Washington conference was on the part of those who persisted in concentrating their fire upon Japan, striving to discredit, isolate and drag her to trial before the court of world opinion. They failed. China and the world will do well to forget them. If the results of the Washington conference are to bring strength and stability to China, she must face the future with a new outlook. She must accept Japan as a friend, for only in this way can the other partners of Japan be of assistance to her. China refused to heed the lesson of the consortium in that Japan and America were the only two nations that had the money to lend her for reconstruction purposes. Unless there was the most complete accord and harmony between Japan and the United States, China could hope for no outside financial assistance. What held good two years ago, holds good to-day. The American people are tired of this incessant nagging of Japan. They want to be friendly with her, co-operate with her and together with the other consortium powers, lead China along the path of true greatness and prosperity.

China's false friends, have had their day. Unless we are very much mistaken their usefullness is finished. Their further employment by China to continue an agitation that has been frowned upon by the best element in the United States will be the one thing that will prevent her from enjoying the fruits of the conference. China has a brilliant future ahead of her. All her friends, stand ready to help to push her along. China will be well advised to turn a deaf ear to those who preach that she has been defeated, and remain well content with the brilliant victory of Sze, Koo and Wang until such time as she gets once more on her feet, and can, with propriety establish her claims to further concessions.

Odagiri Defends Lamont

AS disclosed in the January Number of THE FAR EASTERN REVIEW, the attempt on the part of Mr. Lennox Simpson to impugn the integrity of J. P. Morgan & Company in the matter of the German Hukwang bonds held in America, and through this firm, the consortium as a whole, was immediately resented by Mr. Thomas W. Lamont, who not only clearly stated the facts in regard to the possession of these bonds but found occasion to pay his compliments to the pernicious activities of those who would create suspicion and stir up trouble between Japan and America. In view of this and other efforts on the part of China's advocates to discredit the consortium, Mr. Mannosuke Odagiri (representative of the Japanese banking group in the consortium), in Washington as the financial adviser to the Japanese delegation came to the support of Mr. Lamont in a public statement issued to the press on December 18.

Mr. Odagiri upheld the attitude of Mr. Lamont in insisting that China should pay interest upon the Hukwang bonds of German issue which had come into the possession of Americans.

Mr. Odagiri denied the statement recently made by "Putman Weale," the effect of which was that China had repudiated the German issue of the Hukwang bonds at once upon the declaration of war against Germany. Mr. Odagiri said that no such repudiation was made until some time after war was declared and that therefore these bonds might naturally and properly come into the hands of Americans inasmuch as the repudiation was not announced with the declaration of war. Mr. Odagiri thought it was proper that the American holders of the Hukwang bonds should be paid, as contended by Mr. Lamont.

Mr. Odagiri said he was influenced in making his statement because of the controversy which had been under way between Mr. Lamont and Mr. Simpson.

Object of the Consortium

"The present consortium, as Mr. Lamont has recently written," said Mr. Odagiri, "was formed at the instance of the governments of the United States, Great Britain, France and Japan, with a view to ending competition in the furnishing of public funds to China. The object of creating friendly co-operation among the bankers of these countries was with the hope that this action would contribute to the restoration of a healthier and more stable economic and financial condition in China. When these four countries saw that China was in serious financial difficulties, they got together in an effort to help her avoid what might become a calamity. Other nations have been wrecked by unlimited borrowing and it was desired to save China from such a fate.

"Under existing international handicaps, the Chinese government has been unable up to the present to extricate the country from its difficulties. Some of the government officials have not exemplified the traditions of honesty which made the Chinese merchants of the nineteenth century notable in their dealings with foreigners. The record of Chinese credit, up to recent time, is one of the best examples in history of the highly profitable character of a reputation for honesty, though the integrity of the merchants has not extended fully to the governing classes. The moment it should become clear that money lent in China would be honestly and effectively used, the need for precautions on the part of foreign bankers and foreign governments would disappear.

"No nation alone could furnish the capital for China's gigantic construction and re-organization needs. In the case only of communications the requirement is for billions of dollars. There are approximately only 8,000 miles of railway in China, though her territory is considerably larger than the United States and the population is believed to be four hundred millions. In the United States there are over 270,000 miles of railway.

Must be Absolutely Secure

"Loans of such size as China's needs involve are not made by capitalists. The capitalists only underwrite them for disposal to investors. The bonds cannot be sold successfully unless they are absolutely secure and the income from them is attractive. A prime requisite for such security is a condition of respect for property rights.

"It will be noted that so far the consortium has made no loans to China. A prime rule of the consortium is its purpose to lend money to Chinese governments (central or provincial) for only the larger economic development work of strictly public character, and only on the request of such governments. The consortium refrains strictly from commercial or industrial financing, with which it has nothing whatever to do, and therefore it can hardly be described as exercising a monopolistic control of loans in China.

"The requirement by the consortium of supervision of the receipts and expenditures involved, as security for loans made by it, is strictly in accordance with usual banking practice. It is not for the purpose of securing control of China's finance, but to obtain the customary protection for investors in the loan. They must be assured that the property for whose development their money is borrowed is to receive the maximum benefit from the money, so that the security shall be increased in value and the means for repayment shall be provided. In this case the property requiring development is China, and its managers, the government, should welcome the advice, co-operation and expert book-keeping which the bankers offer for the benefit and protection of both the management and the bondholders. Without such protection it will be impossible for China to borrow large sums of money.

Welcomed Chinese Group

"The organization of the Chinese banking consortium, which was formed last year, was welcomed by the international consortium, and it is to be remarked that this association of Chinese bankers has adopted in practice exactly the same attitude in lending money as that of the foreign group, namely, it has demanded from the Chinese government satisfactory assurance that the money borrowed shall be spent for the purpose for which it is lent and not applied indiscriminately to 'administrative' purposes, for current expenses or maintenance of the various needlessly large provincial military establishments. The two groups of bankers, Chinese and foreign, are in accordance as to purpose and method.

"This is particularly interesting because of the latent financial power in China. There is money there and there is adequate banking machinery to provide funds for government financing. But that power has been withheld by the Chinese bankers and business men because they could hitherto get no satisfactory assurance that money lent to the government would be either used legitimately or repaid when it became due.

"It cannot be too strongly emphasized that the consortium does not seek and does not desire that control of China's finance. It cannot gain such control so long as it follows the principles to which it is committed. And it never has interfered and never will interfere with private financing. The consortium seeks only to help in the establishment of China's financial situation on a sound basis—from which the Chinese will be the first and greatest beneficiaries."

Shanghai Harbor Investigation

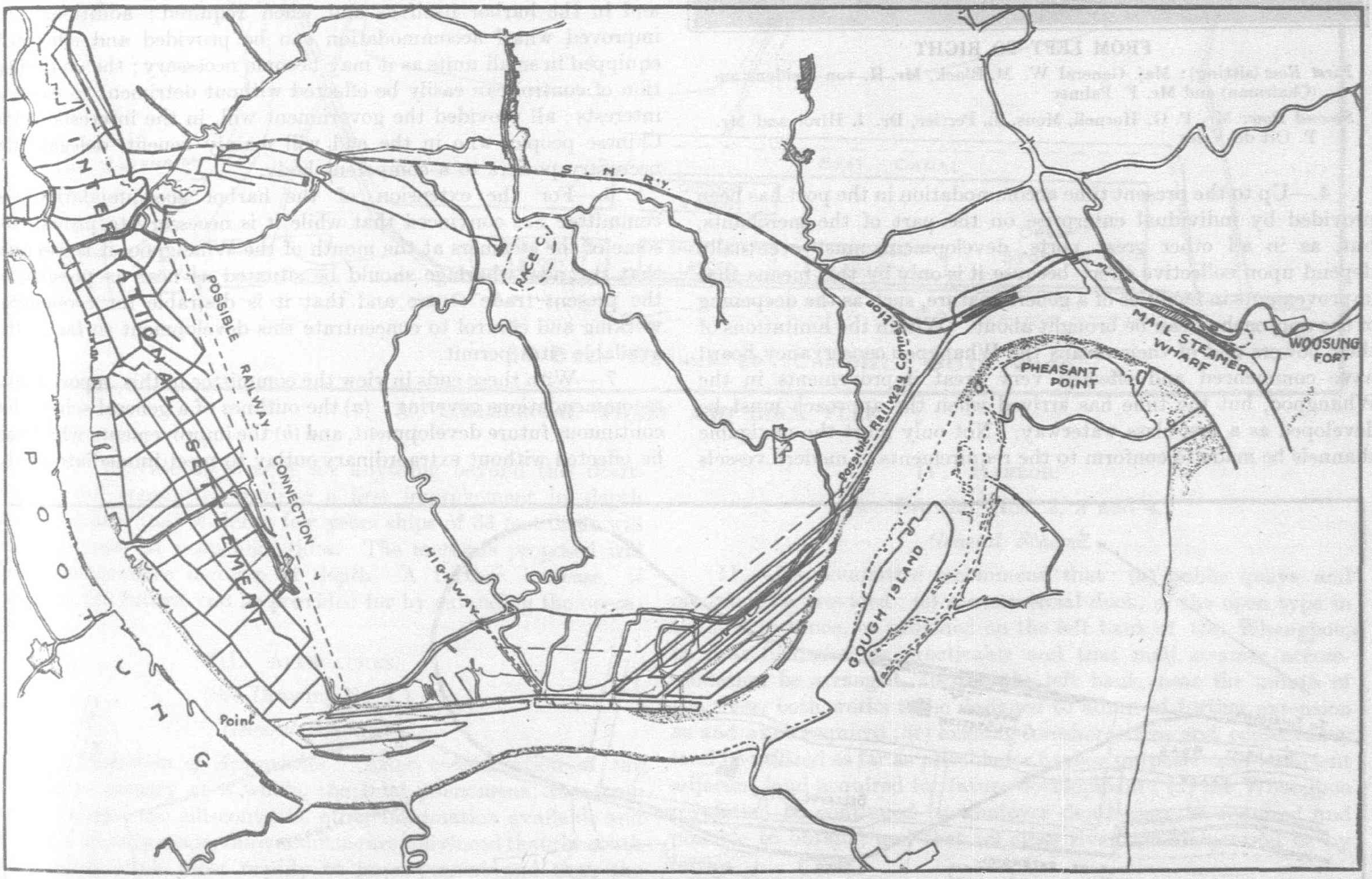
Full Report by the Committee of Consulting Engineers

I. Preamble.

1.—The importance of Shanghai as the commercial gateway of Central China is too well known to need more than the briefest reference in this report. Situated as it is within a few miles of the mouth of the Yangtze River, on the banks of the tributary river Whangpoo and protected by its position against serious danger from typhoons, it is eminently suitable as the distributing port for the commerce of the rich and densely populated basin of that great river, which spreads westward across the whole width of China. In the delta of the Yangtze an area of nearly 50,000 square miles supports a population of over forty million people which is directly dependent on Shanghai, and in the whole watershed of 750,000 square miles the population is one hundred and eighty millions, or more than one-tenth of the inhabitants of the whole world.

2.—In no other part of the world does a population of this volume and density depend for its commercial intercourse upon one main river and one distributing port. For a thousand miles the Yangtze is navigable for river steamers. Hankow, six hundred miles from the sea, is accessible at all times for steamers of 2,000 tons, and during the summer months for vessels up to 8,000 or even 10,000 tons. Throughout the great alluvial plain innumerable waterways form a network extending in all directions, even as far north as Peking, and act as feeders to this mighty waterway for the traffic on which Shanghai is the natural point of distribution.

3.—The gross trade of the port of Shanghai, which in 1920 reached a value of Hk. Tls. 840,000,000, not including transhipments declared for other ports, increased during the period 1900-1913 at the rate of Hk. Tls. 20,000,000 per annum. In 1920 the annual increase compared with that at other great ports of the world is found to be normal, and it seems probable that the pre-war rates of increase will continue. It is certainly very conservative to estimate that the increase in bulk of cargo and in tonnage entered in ten years will be at least 33 per cent. Thereafter the increase is likely to be still greater. It has been possible hitherto to accommodate the trade offering itself, but the growth during recent times in the size and draft of ocean steamers brought about by the need for cheaper transport now makes it incumbent on Shanghai to provide in progressive measure for larger vessels as well as for expanding trade. It is essential that the facilities of the port shall keep pace with the requirements of modern transportation. It can be said safely that, given adequate facilities, the potentialities of Shanghai's



KEY PLAN OF THE WHANGPOO

The Plan here shown of Basins forming the Commercial Wharf and Dock Harbor is a mere indication of possible Development of Available Sites Adjacent to Shanghai. The Actual Layout is a matter for detailed study in the future.

Commercial Wharf and Dock Harbor	Berthing Space Proposed for Immediate Construction Possible Future Berthing Space	2,500 feet 57,000 „
Mail Steamer Wharf	Berthing Space Proposed for Immediate Construction Possible Future Berthing Space	600 „ 6,000 „

enormous and densely populated hinterland, served as it is by probably the most extensive system of waterways in the world, with cheap transportation for both the requirements and the products of the country, afford indisputable indications that the growth of trade will continue.

THE COMMITTEE OF CONSULTING ENGINEERS

FROM LEFT TO RIGHT

First Row (sitting): Maj.-General W. M. Black, Mr. H. von Heidenstam (Chairman) and Mr. F. Palmer

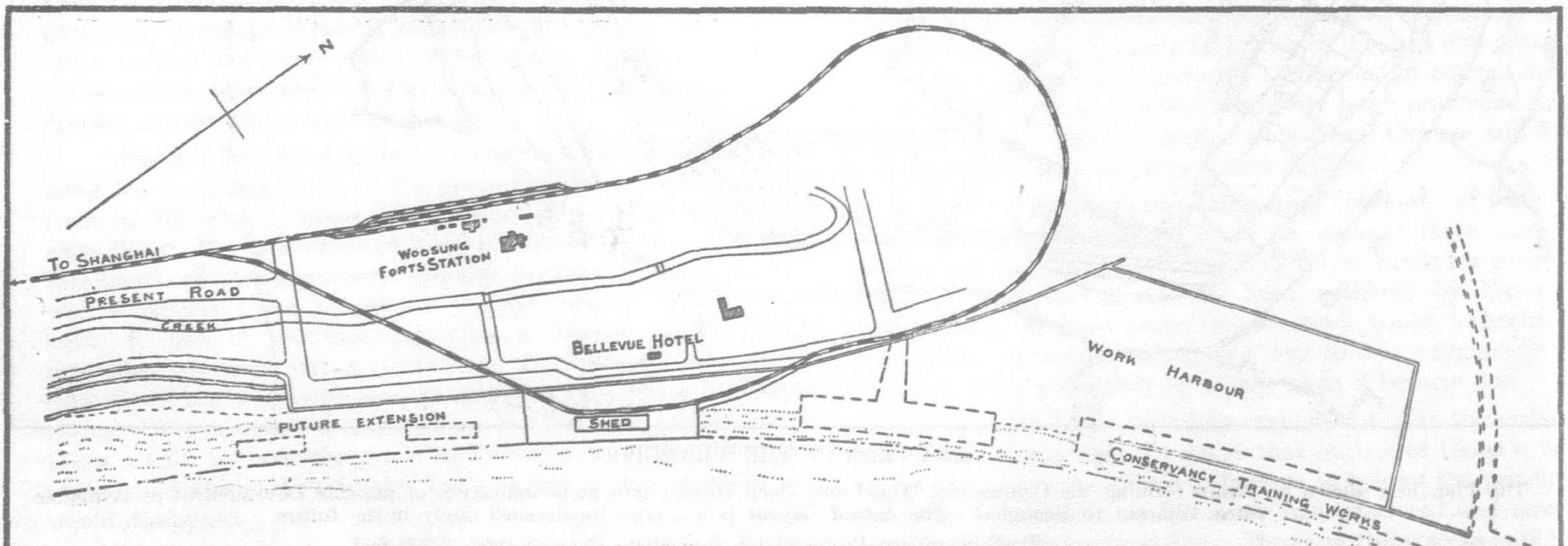
Second Row: Mr. P. G. Hornell, Mons. L. Perrier, Dr. I. Hiroi and Mr. P. Ott de Vries

4.—Up to the present time accommodation in the port has been provided by individual enterprise on the part of the merchants, but, as in all other great ports, development must eventually depend upon collective effort because it is only by this means that improvements in facilities of a general nature, such as the deepening of the approaches, can be brought about. Within the limitations of their powers and of their means the Whangpoo conservancy board have commenced and effected very great improvements in the Whangpoo, but the time has arrived when the approach must be developed as a first-class waterway. Not only must the navigable channels be made to conform to the requirements of modern vessels but many other improvements are equally essential. Additional and deeper wharf frontage, more godowns for the storing of goods, more effective means for the handling and transhipment of cargo, and the extension of the harbor limits to permit of adequate control, are all necessary for the trade of the future and for reducing the cost of dealing with that trade. Whether the existing board are to be given powers to carry out these requirements, or a new board constituted to perform these duties, it is obvious that no time should be lost in creating powers to develop and administer the port as a whole.

5.—The Whangpoo conservancy board have had the Shanghai harbor question under continuous consideration since 1916 and, in addition to their scheme of improving the approaches through the Yangtze, have formulated various projects such as a ship canal to Hangchow Bay, a "*port de vitesse*" on Hangchow Bay, the damming up of the Whangpoo, etc. They have also obtained advice from several consulting engineers on the problems involved. Schemes have also been put forward by outside persons, and, finally, a number of projects have been sketched out and considered by this committee during their session. It is therefore believed that no serious possibility for the solution of the Shanghai harbor question has been overlooked by the committee. It is considered unnecessary to go into these many schemes here or to give all the reasons for and against each one of them. The main proposals hereinafter made are considered manifestly preferable to the other possibilities and no doubt exists in the minds of the committee as to their general suitability. The investigations made show that it is possible to overcome all the deficiencies under which Shanghai now labors, at a cost not incommensurate with the benefits to be obtained. Adequate depths can be secured in the approaches and in the harbor itself as and when required; additional and improved wharf accommodation can be provided and efficiently equipped in small units as it may become necessary; the co-ordination of control can easily be effected without detriment to existing interests; all provided the government will, in the interests of the Chinese people, who in the end will mainly benefit, delegate the necessary powers to a competent body.

6.—For the extension of the harbor accommodation the committee are convinced that while it is necessary to provide for some of the steamers at the mouth of the Whangpoo, it is essential that the new wharfage should be situated as near as possible to the present trade centre and that it is desirable for economical working and control to concentrate this development so far as the available sites permit.

7.—With these ends in view the committee in this report make recommendations covering: (*a*) the outlines of a general scheme for continuous future development, and (*b*) the improvements which can be effected without extraordinary outlay to meet immediate needs.

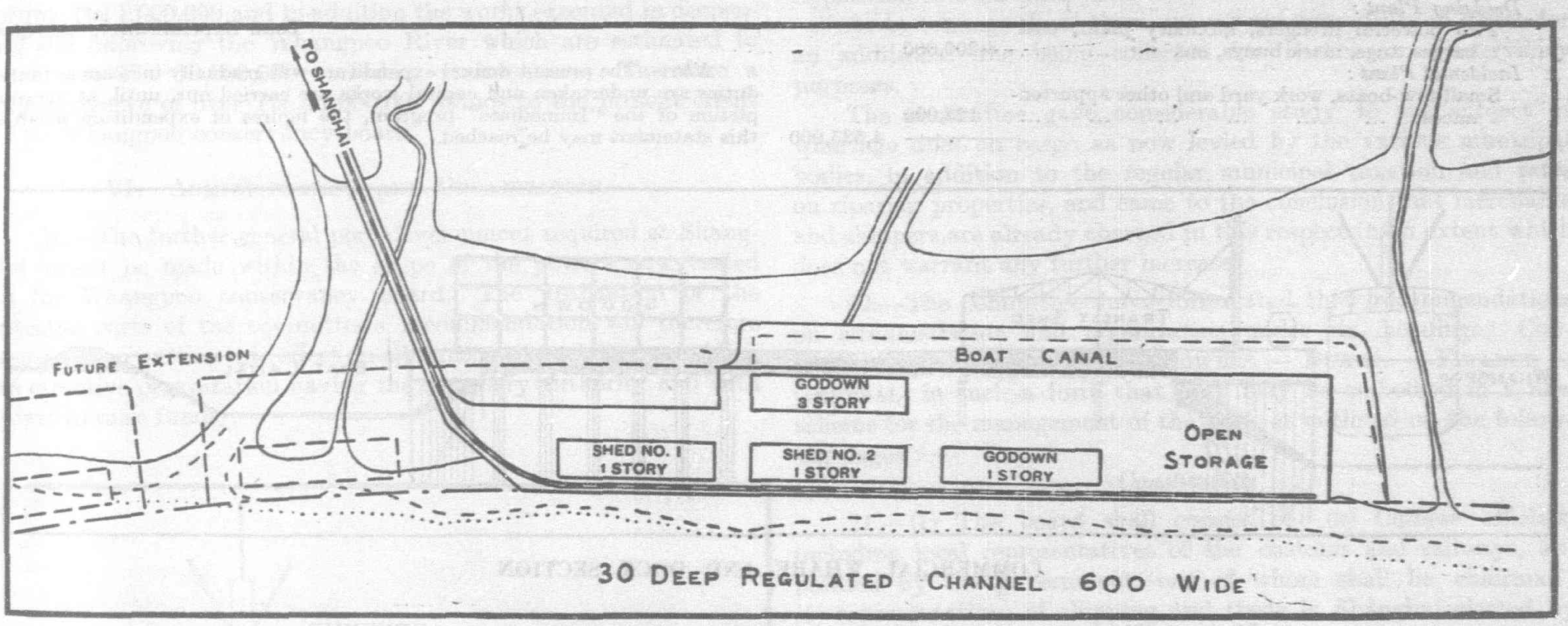


MAIL STEAMER WHARF PLAN

In arriving at the conclusions they have reached, the committee have given the greatest attention to the necessity for limiting the expenditure proposed within the capacity of the trade of the port to pay for such improvements. It is abundantly clear to them that whatever may be the improvements which must be carried out the cost will have to be borne by the trade. Nothing must be done so to burden the commerce of Shanghai as to prejudice the existence of that trade or to stunt its growth, and it is firmly believed that the committee's recommendations are commercially sound. The slight increase of taxation which has to be imposed to meet the cost will be amply repaid by the increased value of the facilities and the economies which will be effected in transportation and in the handling of the goods carried. Without the improvements aimed at by the works proposed, it is obvious that the trade carried in deep draft ships will gravitate to foreign distributing centres and that Shanghai will become a second-class port with consequent great loss not only to local interests, but also to China as a whole.

II. Draft of Ships.

8.—The committee are of the opinion that the trade of the Pacific will in the future be carried in vessels of greater draft than those at present in use, and that in a few years a draft of 33 feet may be reached in the larger vessels for which accommodation will be required in Shanghai. The committee do not consider it advisable to provide at present for anything beyond this draft. Therefore the committee propose a first improvement in depth to such a degree that within a few years ships of 33 feet draft will be able to enter at neap high tides. The methods proposed will afford a progressive increase of depth. A further increase, if required in the future, can be provided for by extending the operations.



COMMERCIAL WHARF AND DOCK PLAN

III. Approaches.

(See Drawing No. 1.)

General Scheme.

9.—(*a*) *Selection of Approaches*: After consideration of the Yangtze estuary as a whole, the tidal phenomena, the fresh water discharge, the silt-contents, other information available and the reports already made, the committee are convinced that the south channel lends itself most readily to improvement and that the work of obtaining a greater depth should be undertaken along this channel. (*b*) *Regulation*: The committee are of opinion that deepening in the south channel should be undertaken by dredging only, at least in the first instance, and that by this means there is a reasonable prospect of permanent improvement. (*c*) *Observations*: The committee consider that extensive and continuous observations should be carried on in the estuary to provide further information for river engineering purposes, in addition to that available from the navigation charts which may be published from time to time by the Chinese maritime customs.

Immediate Requirements.

10.—The committee recommend that the harbor authority should proceed: (*a*) to carry out forthwith the river engineering observations indicated under 9 (*c*), General Scheme; (*b*) to make and maintain a channel through the fairy flats, developing it gradually foot by foot, to as great a depth and width as required and possible, and to provide as soon as feasible a channel of 600 feet bottom width for the passage of ships drawing 33 feet at ordinary neap high water;

As the mean ordinary neap high water level is 28 feet above the present crest of the fairy flats, and allowances of 3 feet for clearance, wave action, etc., and one foot for the fall of tide during the ship's passage are necessary, this means the attainment of a depth at neap high water of 37 feet or a deepening of 9 feet on the crest.

(*c*) to hire or acquire—whichever is more economical—for the purpose of carrying out this work at least two dredgers of the most powerful type which can be operated on the fairy flats in a depth not exceeding 18 feet; (*d*) to carry out any auxiliary works which may be necessary; and (*e*) to consult the Chinese maritime customs as to the provision of marks and of a first-class depth signalling arrangement at the bar.

IV. Harbor.

(See Drawing Nos. 2, 3 and 4.)

General Scheme.

11.—The committee recommend that: (*a*) public quays and moorings be provided; (*b*) a commercial dock, of the open type in the first instance, be provided on the left bank of the Whangpoo, as near Shanghai as practicable and that mail steamer accommodation be arranged, also on the left bank, near the mouth of the river, both works to be designed to admit of further extension as and when required; (*c*) existing foreshore areas and conservancy land be utilized as far as possible for harbor purposes and sufficient adjacent land acquired for future development; (*d*) the Whangpoo regulation be continued to whatever depth may be required and possible to obtain; and that (*e*) cross river communication be by ferries.

Immediate Requirements.

12.—To meet immediate needs, the committee recommend that: (*a*) the engineer-in-chief's "General Work Program" of April, 1921, for the further regulation and maintenance of the Whangpoo be carried out with certain reservations, namely: (1) dredging only should be employed in the first place as a means of improving the fairway depth to 30 feet at lowest low water; (2) all areas between the old high water lines should be reserved under the board's jurisdiction for potential harbor, industrial and other purposes; (*b*) a wharf 600 feet long be constructed on the left bank near the mouth of the Whangpoo for mail and passenger steamers; (*c*) berthing 2,500 feet in length be provided at once for four or five vessels at suitably equipped riverside wharves with transit sheds, godowns, canal frontage for small craft, and provision for rail connections when required; (*d*) the existing river moorings be acquired and added to as required; (*e*) in the meantime projects be developed for more extensive accommodation in basins, the construction of which should be carried out as and when required; (*f*) as an essential, all the necessary land be acquired at once; and that (*g*) all these immediate and future works should be provided and administered by the harbor authority.

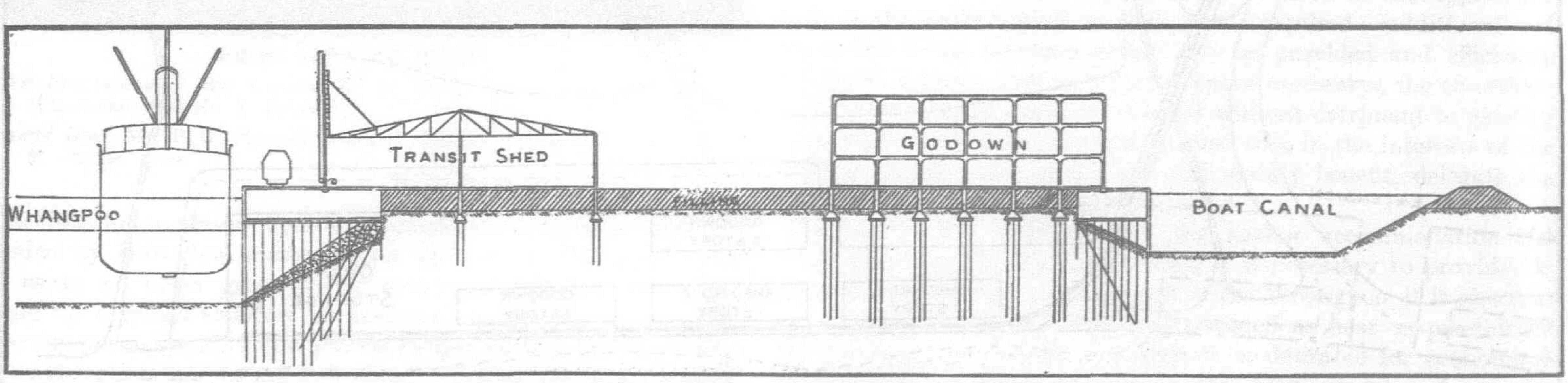
V.—ESTIMATES FOR IMMEDIATE REQUIREMENTS.

Capital Expenditure.

13.—The immediate measures outlined above have been estimated to involve capital expenditure in connection with plant and construction costs approximately as follows:

IMPROVEMENT OF APPROACHES:

	Sh. Tls.	Sh. Tls.
Survey Plant:		
Sea-going survey ships, pinnaces, beacons, instruments, etc.	200,000	
Dredging Plant:		
Two powerful dredgers, auxiliary plant, coal barges, tugs, mark buoys, etc.	4,200,000	
Incidental Plant:		
Small tow-boats, work yard and other appurtenances	125,000	
		4,525,000



COMMERCIAL WHARF AND DOCK SECTION

HARBOR WORK:

	Sh. Tls.	Sh. Tls.
Plant for Whangpoo Regulation	725,000	
Commercial Wharf and Dock: 2,500 lin. feet of public wharf 3 transit sheds, 120′ by 500′ Godown, 3-story (120′ by 500′). Open storage, 360,000 sq. ft. Lighter and native craft accommodation 100′ by 1,800′ Appurtenant terminal works, such as railway, roadway, paving, mechanical equipment, lighting, etc. Total cost including interest during 3 years' construction period	4,500,000	
The capacity of the wharf as outlined above is 500,000 tons per annum, but in estimating revenue a wharf capacity of 350,000 tons only has been taken.		
Mail Steamer Wharf 600 lin. feet of wharf. Transit shed 50′ by 250′ Appurtenant rail, roadways, paving, lighting, etc. Cost with accrued interest during construction period	620,000	
The capacity of the mail wharf is at least 200 berthings per annum, but in estimating revenue only 100 berthings per annum have been allowed for and a tonnage of 80,000.		
Purchase of 19 Moorings	380,000	
		6,225,000
Total Capital Cost... ...		Sh. Tls. 10,750,000

Annual Receipts and Expenditure.

14.—A statement of annual receipts according to the taxation, detailed in Section VI under "Finance," based on 1921 trade figures, together with the estimated revenue from harbor utilities and of estimated expenditures is given below in the form of a working account:

EXPENDITURE.

	Sh. Tls.	Sh. Tls.
GENERAL EXPENSES:		
Improvement of Approach—		
Survey	100,000	
Dredging	1,000,000	
		1,100,000
HARBOR EXPENSES:		
Whangpoo Regulation	531,000	
Commercial Wharf and Dock (2,500 lin ft.)		
Dredging	25,000	
General maintenance	12,000	
Working costs	120,000	
Mail Steamer Wharf (600 lin ft.)		
Dredging	4,000	
General maintenance	2,000	
Working costs	16,000	
Moorings—		
Maintenance	9,500	
Working costs	2,000	
		721,500
Interest Charges—		
Port Debentures 11,020,000 @ 8%	881,600	
Sinking Fund @ 1½%	165,300	
		1,046,900
Balance, surplus		4,100
Total Expenditure...		2,872,500

Note.—The present annual expenditure will gradually increase as further duties are undertaken and capital works are carried out, until, at the completion of the "Immediate" program, the figures of expenditure shown in this statement may be reached.

REVENUE.

	Sh. Tls.	Sh. Tls.
GENERAL INCOME:		
Conservancy tax (net) 6 per cent. on customs duty (approx. 0.3 per cent. *ad valorem*) ...	1,610,000	
Transhipment tax at 0.15 per cent. *ad valorem*...	150,000	
Tonnage dues	370,000	
Permits for work, say	3,500	
Shengko receipts, say	26,500	
		2,160,000
HARBOR EARNINGS:		
Commercial Wharf and Dock (2,500 lin ft.)		
Cargo	350,000	
Berthing	75,000	
Godown storage	180,000	
Mail Steamer Wharf (600 lin ft.)		
Cargo	60,000	
Passengers	10,000	
Berthing	9,000	
Moorings	28,500	
		712,500
Total Income ...		2,872,500

Note.—The revenue, based on 1921 figures, given in this statement will be greater from year to year owing to the constantly increasing value of trade. The conservancy tax at present contemplated is only 6 per cent. while the powers proposed allow of 10 per cent. on the customs duty, so that not only will the surplus be greater than shown but there is also a reserve of taxation amounting to over 1,000,000 taels per annum. In the same way, the transhipment tax estimate is only 60 per cent. of the amount authorized.

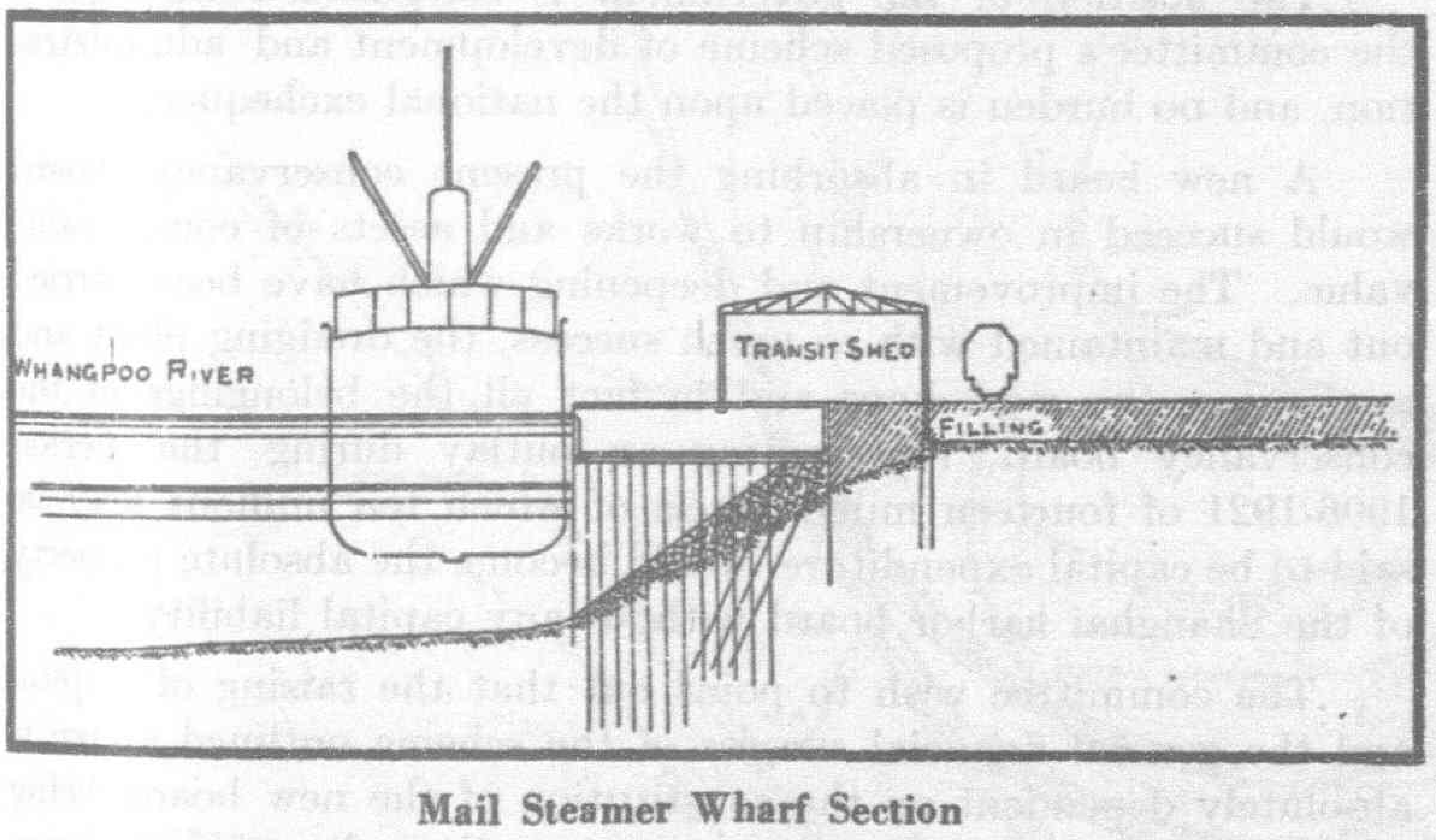
15.—The following table shows against the capital requirements the program by which the funds may be raised by means of port debentures :—

Funds to be Raised.	Sh. Tls.	Sh. Tls.	Capital Requirements.	Sh. Tls.	Sh. Tls.
Port Debentures :			Approaches :		
1st Year ...	2,050,000		Survey plant ...	200,000	
			Dredging plant....	4,200,000	
2nd ,, ...	4,100,000		Miscellaneous expenditures ...	125,000	
3rd ,, ...	4,870,000				4,525,000
		11,020,000			
			Harbor :		
			Plant for Whangpoo regulation	725,000	
			Commercial wharf and dock ...	4,470,000	
			Mail steamer wharf ...	650,000	
			Moorings ...	380,000	
					6,225,000
					10,750 000
			Flotation expenses ...		270,000
		11,020,000			11,020,000

In regard to capital requirements the table above relates only to works still to be provided. The new board would, however, take over tangible assets in plant, property and cash to the value of over Tls. 1,000,000 and in addition the works executed in deepening and improving the Whangpoo River which are estimated to have cost Tls. 10,000,000 excluding maintenance. Therefore a capital reserve of over Tls. 11,000,000 stands to the present credit of the Whangpoo conservancy board.

VI. Administration and Organization.

16.—The further general port development required at Shanghai cannot be made within the scope of the powers now vested in the Whangpoo conservancy board. The realization of the essential parts of the committee's recommendation will therefore depend upon putting into effect an administrative scheme, providing an executive organization having the necessary authority and with power to raise funds.



Mail Steamer Wharf Section

17.—The formal reference of this question to the committee requires a definite reply, and after careful consideration of the local conditions in comparison with those of the many other ports of the world with which the various members have been associated, the committee are of opinion that the requirements can be met only by the revision of the existing Whangpoo conservancy agreement of 1912 and the expansion of the present board into a new body, which might be known as the Shanghai harbor board, with more extended powers and more directly representing shipping and trade interests. It has been proved beyond doubt that port growth and efficiency are best developed where the governing body includes representatives of shipping and trade interests as well as government officials.

18.—The technical schemes recommended by this committee are of two classes :

non-revenue producing, *e.g.*, the improvement of the approach and of the channel of the Whangpoo ;

revenue producing, *e.g.*, harbor utilities such as public wharves, moorings, etc.

19.—The committee have carefully considered all the sources of revenue and consider that while the operations under the second class may be reasonably expected to be self-supporting, it will be necessary to exploit other sources of revenue to pay for the services required under the first heading.

The conservancy tax, at present three per cent. of the customs duties, is no more than one-eighth of one per cent. on the actual value of the trade. To raise this taxation even to one-half of one per cent. *ad valorem* would be an increase quite insignificant as compared with the every-day fluctuations in business conditions, such as cost, freight or exchange.

Cargo transhipped in Shanghai, but declared for other ports, contributes nothing at present to the revenues of the port, the only charge upon it being the tonnage dues imposed for general coast lighting and other aids to navigation. There would be no hardship in imposing a transhipment tax on this transhipped cargo not exceeding one-half of that on cargo passing through the customs. Some difficulties might occur in levying it, but by the imposition of bulk rates these may be overcome.

As to tonnage dues, there are several precedents in China for an additional due being collected for harbor or conservancy purposes.

The committee gave considerable study to the subject of wharfage dues on cargo as now levied by the various municipal bodies, in addition to the regular municipal taxation and rates on riparian properties, and came to the conclusion that merchants and shippers are already charged in this respect to an extent which does not warrant any further increase.

20.—The committee have formulated their recommendations on administration and organization under six headings : CONSTITUTION — JURISDICTION — POWERS — DUTIES — FINANCE — GENERAL, in such a form that they may be embodied in a new scheme for the management of the port, as outlined on the following pages :—

Constitution

21.—(1) The board shall consist of : (*a*) Chinese officials, including local representatives of the customs and railways, appointed by the government, one of whom shall be chairman ; (*b*) representatives of shipping and trade in Shanghai elected by local interests and also to a limited extent representatives of municipalities ; (*c*) a general manager, appointed by the board, who shall be, *ex-officio*, vice-chairman. (2) The members under "(*a*)" shall hold office as long as they fill the positions by virtue of which they sit on the board.

When the board are first organized the term of office of one-half of the elected members shall be one year only, the selection to be determined by themselves, and one-half two years ; thereafter the term of office shall be two years. (3) The several members of the board have, as such, equal authority, and the opinion of the majority is to be determinative. In all meetings of the board, if votes are equally divided, the chairman shall have a casting vote. A majority of the whole number of members shall form a quorum.

Jurisdiction.

22.—(1) The general jurisdiction of the board shall extend : (*a*) in the Whangpoo, from its junction with the Yangtze to the tidal limit and laterally between the high water lines of ordinary spring tides. Highwater of ordinary spring tides is defined as twelve and one-half feet above Woosung datum. Within these limits no operation which in the opinion of the board may affect the regimen or navigability of the river shall be undertaken without the board's consent, nor without such consent shall wharves, jetties, pontoons, hulks, etc., be established : (*b*) in the approaches, from Saddle Islands to Plover Point (the 121st meridian east of Greenwich), in so far as concerns the work of hydrographic survey and the improvement and maintenance of the approach channel: (*c*) over such areas as may be acquired for harbor purposes. (2) The harbor shall consist of the Whangpoo River, from a line drawn square to the river from the upper side of the entrance of the Yang Shih Chiao Creek above Lunghua, down to the mouth of the river, including all public wharves and areas devoted to public purposes and provided by the board, and also of the Woosung anchorage in the Yangtze River.

Powers.

23.—(1) The authority vested in the board is delegated to it by the Chinese government, and the board are in no way subordinate to the provincial authorities. (2) The board are empowered: (*a*) to deal with and improve the navigation and harbor facilities of the port and its approaches; (*b*) to acquire land necessary for harbor purposes and also to acquire private harbor utilities, by agreement or by expropriation. If the method of expropriation be used, the price shall be submitted to arbitration (*c*): to construct all public harbor works and provide other public harbor facilities as needed; (*d*) to operate and administer public harbor works and utilities so provided. The board shall undertake watch and ward within the limits of all areas so occupied and used; (*e*) in co-operation with the maritime customs to frame harbor regulations, not affecting the proper authority of the customs; all these regulations to be enforced as heretofore by the maritime customs. The control of river police, of sanitary arrangements, of aids to navigation and of pilotage, remain as heretofore in the hands of the maritime customs; and (*f*) to receive and expend funds for the above purposes and to borrow money for the same. (3) The provision of the scheme for the administration of the Whangpoo conservancy, agreed to April 4, 1912, relating to the sale of crown lands, including the supplementary article agreed to January 19, 1916, shall remain in force and the privileges and powers then granted shall be transferred to the harbor board. Sub-section 9 to the above article shall be amplified as follows:

> In the case of Chinese deeds purporting to include an area outside the high water line as it existed in 1906, the shengko area shall be reduced by such title deed area in cases where the title deed was issued prior to 1906. This deduction shall not, however, apply to any area under the general jurisdiction of any government or provincial department over such foreshores prior to 1906.

Duties.

24.—(1) It shall be the duty of the board: (*a*) to provide a navigable channel in the outer approaches and in the Whangpoo, of width and depth sufficient for the needs of the port; (*b*) to provide, increase and maintain harbor accommodation, utilities and improvements, as may be needed; (*c*) to operate and administrate all utilities and facilities provided; (*d*) to formulate from time to time projects with estimates of costs for works to be undertaken; (*e*) to maintain the existing and future works and improvements in effective condition; (*f*) to co-operate at their discretion in the improvement of private harbor facilities, charging reasonable rates for services rendered; (*g*) to receive and consider applications for permits for private works, and to supervise the execution of such works as may be authorized; (*h*) to prepare in advance a budget dealing with both capital and revenue for the forthcoming year; and (*i*) to publish a report annually of all operations of the board together with full statements of receipts and expenditures.

Finance.

25.—(1) The board shall have entire charge of the finance connected with harbor matters. In this connection: (*a*) they shall receive and take charge of all the funds, properties, assets and obligations of the Whangpoo conservancy board; (*b*) they shall receive all taxes, dues, grants and revenue from other sources, as specified under Clause 2; (*c*) they shall disburse the funds required for their administration and executive work at their discretion, taking all customary measures for the safeguarding of their funds, including the requirement of security by disbursing officials; (*d*) proper accounts shall be kept and audited at regular intervals; (*e*) in case of taking up loans the board shall inaugurate a sinking fund to redeem the loan in a period not exceeding 30 years in the case of works and 60 years in the case of lands. (2) The board shall be empowered to cause to be levied the following taxes at rates to be fixed annually, and advertised six months before they come into effect: (*a*) a conservancy tax of not exceeding ten per cent. of the gross customs duties and in the case of duty free goods not more than one-half of one per cent. *ad valorem*; (*b*) a transhipment tax on cargo directly transhipped to other ports, and not paying customs dues in Shanghai, of not more than one-fourth of one per cent. *ad valorem*; and (*c*) a tonnage due of not more than ten candareens per net registered ton of shipping using the harbor, imposed according to the present system of levying tonnage dues for general coast lighting and aids to navigation. (3) These taxes shall be collected by the Shanghai commissioner of customs and shall periodically on fixed dates be paid to the harbor board's account. (4) The board shall frame from time to time a scale of charges for the use of facilities provided, and for services rendered.

General.

26.—(1) The board shall, at their discretion, appoint, control and discharge the staff. (2) For all contracts in connection with the works and, under such regulations as the board may determine, for the purchase of material or machinery, for the leasing of public utilities and for the disposal of old plant and stores, etc., public tenders shall be invited and the tender offering the most advantageous conditions shall be accepted.

VII. CONCLUDING REMARKS.

27.—In conclusion the committee desire to point out that a well organized and experienced body already exists in Shanghai to form the nucleus of an efficient harbor administration.

The inauguration of a strong public harbor policy at the earliest possible moment is indeed a *sine qua non* for the prosperity of the port, will strengthen the position of Shanghai as the principal transhipment and distributing centre, and will confer immense benefits upon the shipping and commerce of China.

The position of the government is safeguarded throughout the committee's proposed scheme of development and administration, and no burden is placed upon the national exchequer.

A new board in absorbing the present conservancy board would succeed in ownership to works and assets of considerable value. The improvement and deepening which have been carried out and maintained with so much success, the dredging plant and appliances, the workshops and in fact all the belongings of the conservancy board, representing an outlay during the period 1906-1921 of fourteen million taels of which ten millions may be said to be capital expenditure, would become the absolute property of the Shanghai harbor board without any capital liability.

The committee wish to point out that the raising of capital and the general financial success of the scheme outlined above is absolutely dependent on the constitution of the new board being such that there are ample guarantees as to the policy and efficiency of that board's operations. They do not however feel sufficiently informed to detail the personnel for the board beyond saying that commercial interests must be adequately represented and have therefore thought it best to confine their report in this respect to the general recommendations they have made.

The committee most strongly urge the acceptance of their proposals as representing, in their opinion, the best, in fact the only, practicable means of developing the port.

W. M. BLACK; I. HIROI; P. G. HÖRNELL; F. PALMER; L. PERRIER; P. J. OTT DE VRIES; H. VON HEIDENSTAM (*Chairman*), *Members of the Committee of Consulting Engineers.*

Shanghai, 30th November, 1921.

Lower Liao River Conservancy

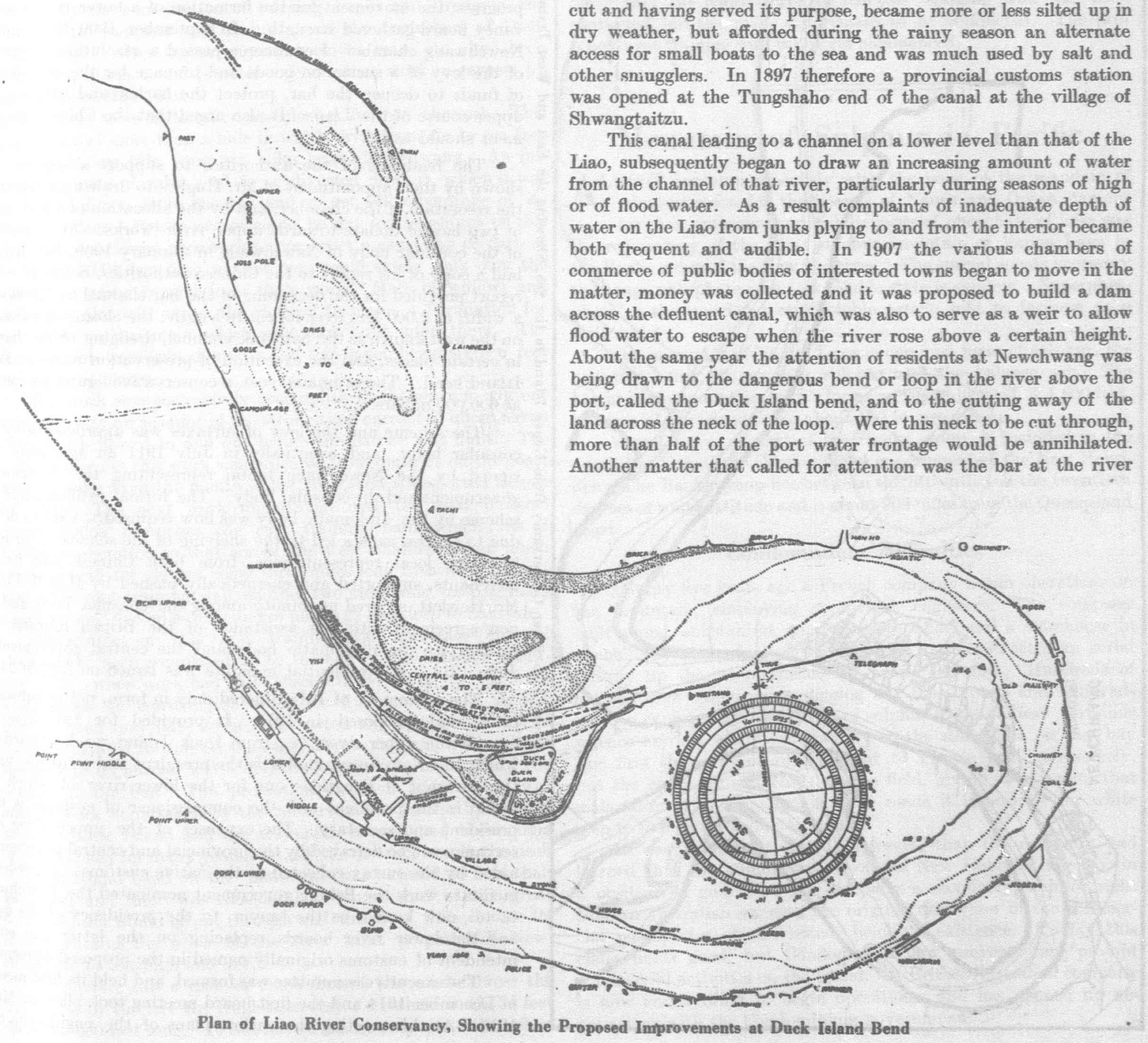
First Annual Report

THE River Liao, at the mouth of which is situated the port of Newchwang (Yingkow), rises in the Mongolian table lands several hundred miles to the north and west of the port. It forms the natural means of communication between the interior and the sea coast. Its principal inland mart and the head of the large class of junk traffic is Tungchiantzu, 30 miles north of Tiehling and some 160 miles N.E. from Yingkow and 255 miles from Yingkow by River, situated just near the junction of the East and West Liao River (see Plan No. 6.) On this river thousands of junks (the number has been placed as high as 40,000) plied a busy trade. Like all alluvial rivers it was subject to change of course and to formation of sand banks. When the entrance to the river was surveyed by H.M.S. *Actaeon* in 1860 the port for sea-going junks was at Tienchwangtai some 30 miles from the sea, while the original sea port that gave its name (Newchwang) to the present town was some 23 miles further inland.

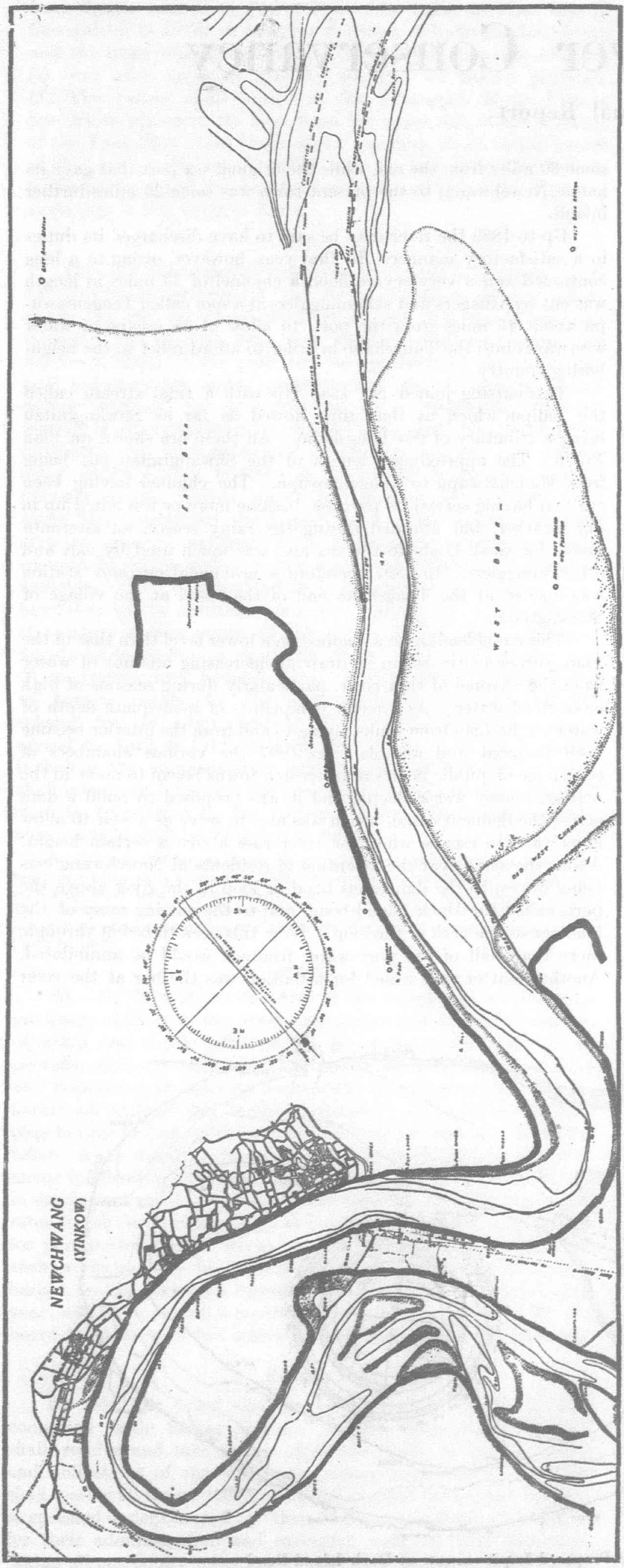
Up to 1889 the river may be said to have discharged its duties in a satisfactory manner. In that year, however, owing to a long continued and a very severe flood a channel of 33 miles in length was cut by villagers and salt smugglers at a spot called Tengchiawupu about 45 miles from the port, to allow of an escape of water westwards into the Tungshaho in order to afford relief to the neighboring country.

This cutting joined the Liao Ho with a tidal stream called the Palipu which at that time flowed as far as Shwangtaitzu being a tributary of the Tungshaho. All these are shown on Plan No. 6. The approximate length of the Shwangtaitzu cut being from Hanchaiwupu to Tengchiawupu. The channel having been cut and having served its purpose, became more or less silted up in dry weather, but afforded during the rainy season an alternate access for small boats to the sea and was much used by salt and other smugglers. In 1897 therefore a provincial customs station was opened at the Tungshaho end of the canal at the village of Shwangtaitzu.

This canal leading to a channel on a lower level than that of the Liao, subsequently began to draw an increasing amount of water from the channel of that river, particularly during seasons of high or of flood water. As a result complaints of inadequate depth of water on the Liao from junks plying to and from the interior became both frequent and audible. In 1907 the various chambers of commerce of public bodies of interested towns began to move in the matter, money was collected and it was proposed to build a dam across the defluent canal, which was also to serve as a weir to allow flood water to escape when the river rose above a certain height. About the same year the attention of residents at Newchwang was being drawn to the dangerous bend or loop in the river above the port, called the Duck Island bend, and to the cutting away of the land across the neck of the loop. Were this neck to be cut through, more than half of the port water frontage would be annihilated. Another matter that called for attention was the bar at the river



Plan of Liao River Conservancy, Showing the Proposed Improvements at Duck Island Bend



Lower Liao River Conservancy from Goose Island to the Sea, Showing the East and West Training Walls and Approaches

mouth which was increasing in length and reported to contain less water than was desirable. Agitation on these matters led to the survey of the bar and river by the marine department of the customs, and on the invitation of the provincial authorities a visit was paid to the spot by Mr. de Rijke, the government's engineer-in-charge of the Huangpu river conservancy at Shanghai.

The work of building a dam to regulate the flow of water from the Liao into the Shwangtaitzu canal was taken in hand in 1908 under the direction of the Manchurian government's engineer Mr. W. R. Hughes, M. Inst. C.E., London. Progress was made but slowly. Completion in 1910 was prevented by the high water of that year and by the immense volume of water passing down the new channel. In the following year just when dam and sluice gates were on the point of completion, the work was wrecked by the rising of the country people. Injury to vested interests and fear of floods were said to be causes of the rising; however this may be the fact remains that the general state of unrest due to the revolution combined with other causes led to the complete cessation of all further work. To such a pitch indeed had local feeling been wrought upon that it was more than a man's life was worth to visit the spot with a view to examine and re-commence operations.

While the work of the government on the upper river was in progress, the movement for the formation of a lower river conservancy board gathered strength. In September 1909 the (foreign) Newchwang chamber of commerce passed a resolution approving of the levy of a surtax on goods and tonnage for the provision of of funds to deepen the bar, protect the harbor and improve the upper course of the Liao. It also urged that the Chinese government should assist.

The readiness of the authorities to support a scheme was shown by their appointment of Mr. Hughes to draw up a report on the resolution of the chamber, and by the allocation of a first grant of two lacs of dollars towards upper river works. At a meeting of the consular body of Newchwang in January 1909, Mr. Hughes laid a copy of his report to the Chinese authorities, before it. The report provided for the deepening of the bar channel by 5 feet with a width of 2,000 feet over its entire length; the closing of a channel on the west known as the bar junk channel, dredging of the harbor in certain places, and the execution of preservation works at Duck Island bend. The estimated cost, a conservative figure, was placed at 600,000 dollars.

The scheme and the levy of surtaxes was approved of by the consular body, and eventually in July 1911 an agreement was signed by the Newchwang taotai representing the Manchurian government and the consular body. The formal ratification of the scheme by the diplomatic body was now required. Various delays due to several causes led to the shelving of the scheme. In 1913, however, local representations, from both Chinese and foreign merchants, supported and energetically pushed by H.B.M. Consul Mr. Hewlett, secured unanimity among the consular body and the new agreement with the assistance of the British minister was ratified by the diplomatic body and the central government in June 1914. A presidential mandate was issued on August 23.

The agreement of 1914 differed only in form, not in substance from that proposed in 1911. It provided for two boards—one for the upper river, *i.e.*, from Duck Island reach upwards, of which the Newchwang taotai is the president and controller under the governor of Fengtien; one for the lower river of which the taotai is the president and the commissioner of customs is vice-president and secretary. The expenses of the upper river conservancy will be defrayed by the provincial and central government, aided by the surtax collected at the native customs. In order to facilitate work the Peking government nominated the Newchwang taotai, now known as the taoyin, to the presidency of the upper and the lower river boards, replacing on the latter the superintendent of customs originally named in the proposed agreement.

The executive committee was formed, and held its first meeting in December 1914 and the first board meeting took place in March 1915. At this meeting the outline plans of the engineer-in-chief were accepted and sanction was given to the proposal of the executive agreed to by the Manchurian government, that a dredger should be purchased by the boards of the upper and lower conservancy acting together, thereby greatly reducing working expenses. Active enquiries were made with a view to secure an efficient and reliable dredger.

A 7 per cent. loan for 6 lacs of dollars was concluded with the Hongkong and Shanghai Bank and the Russo-Asiatic Bank in equal shares from each Bank, and in 1919 a loan of Haikwan Tls. 400,000 was granted to the lower conservancy board by the inspector-general of customs. It may be of interest to add that the Shwangtaitzu canal has now become a large river entering the gulf about 30 miles west of Yingkow, and that the village of Shwangtaitzu, some 11 miles from the sea, is rising at a rapid rate to a mart of considerable importance. The distance of Tengchiawupu from the sea via Shwangtaitzu being approximately 45 miles as against 95 miles via Yingkow. It naturally follows that the water takes the most direct way to the sea via Shwangtaitzu with the consequent loss of fresh water to the Liao Ho.

The report and plans of the work that has been carried out and the progress that has been made follows: The works under the control of the lower conservancy board consist of the deepening of the bar by the construction of training banks and dredging, the closing of the east and west channels, and the protection of Duck Island bend. After the arrangement of the loan, etc., had been completed, it was found possible to commence work in earnest by the middle of May 1916.

The first to be undertaken was closing the west channel. This was a channel more than a mile in width, with from six to ten feet of water at low tide, some six miles below Newchwang. An immense quantity of water used to be diverted down it, which it was desired to direct on to the bar and so get full advantage of its scouring effect. Before access could be got to the shores of this channel it was found necessary to construct a causeway or path of reed mats 3,000 feet long so that men could safely walk over the soft silt in going to and from their work. Mats of willows and reeds were also laid across the channel to make a foundation for the rubble embankment which was then built upon them. The embankment was carried up to half-tide level, being sixteen feet high in some places.

The work was successfully accomplished, though not without some difficulty on account of the strong tidal current of about seven knots which flowed in and out before the barrier was built. The stone required in this work was procured from quarries on the coast some 30 miles from the mouth of the river, and transported thence by junks. The next work undertaken was the east channel closure which comprises the east training bank which was of similar construction to that across the west channel but of much greater length the closure being three miles long with its continuation. The east training wall, another two miles long, making in all a training wall five miles long and in places 22 feet deep to half-tide.

Three miles of this east training wall and east channel closure have been completed up to the end of this season's operation (1920), when work had to be discontinued owing to the frost which stops all construction work for five months. A similar training bank may have to be constructed on the opposite side of the river parallel to that on the east side, so as partly to constrict the river to its normal width and concentrate the full force of the current on the bar. The protection of Duck Island bend was another work undertaken by the conservancy. In the bye-course between Duck Island and the mainland, erosion had been going on very rapidly for many years past, till the distance across the neck of Duck Island bend on the mainland was reduced to less than 1,500 feet and there was considerable danger that in any great flood the neck would be cut through and the river thus change its course—causing the whole of the river front property of Newchwang to be left high and dry.

To obviate this a dam or embankment was made across the bye-course by the late Mr. Hughes, M. Inst. C.E., where it was 34 feet deep and 600 feet long. It can have been no easy matter to effect this, owing to the strong river current, but fascine mattresses of willows were made 45 feet long and 35 feet wide and sunk in place by loading with stone. Successive layers were superimposed one on the other till the surface of the water was finally reached. Besides the barrier or dam above mentioned, a low dyke was constructed along the river for six miles to prevent it overflowing at that place and so cutting across the neck of the bend. Before finally deciding on the use of training banks, as well as a limited amount of dredging, in December 1915 the opinion was obtained of the firm of consulting engineers, Sir John Wolfe Barry, Lyster and partners on the whole scheme for the improvement of the lower river. Again in 1920 a very complete set of the latest surveys of the bar and river together with current and tidal observations showing the effect that the training walls and works had already had upon the river and bar were forwarded to the consulting engineers, Sir John Wolfe Barry, Lyster and partners together with the report of the engineer, and their opinion again obtained. Their report verifies that of the engineer with the exception that the consulting engineers recommend a slightly different alignment for the proposed training wall at Duck Island bend. The works already carried out at Duck Island can only be of a temporary relief and some work must in future be done there or Newchwang may cease to exist. Since 1917 the construction of the east training wall has been continued, but two miles still remain to be completed. The proposed west training wall is not yet commenced.

Mountain of Sulphur in Pacific

ALMOST contemporaneously with the issue of the mandate of administration for the islands of Nauru and Ocean, famous for their extensive and rich deposits of phosphate of lime was the rediscovery of the great sulphur mountain of Vanua Lava in the Banks group of the New Hebrides. The special agents necessary to change phosphate rock to a soluble state is sulphur. Superphosphate is the powdered and soluble article sold to farmers as a fertilizer.

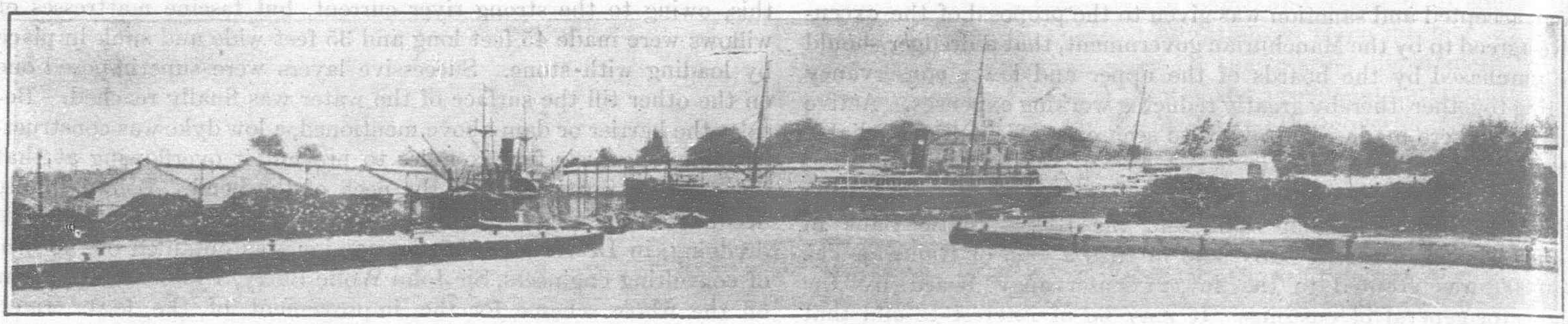
The mountain of Vanua Lava is one vast mass of sulphur, the quantity being 99 per cent sulphur and the balance ash. The height of the mountain, which forms an island in itself, is 1,600 feet, the area of the island being about 100 square miles.

Vanua Lava, as part of the Banks group, is included in the administration of the Condominium government of the New Hebrides. The Banks group lies between the fifteenth and the twentieth degrees of south latitude and is about 900 miles from the Queensland coast.

Condominium Difficulties

Twenty-five years ago a French company began operations on the mountain, employing competent engineers. The company built a long, substantial, coral-concrete wharf and a storehouse in a small bay at the foot of the mountain and constructed an aerial railway up the mountainside for nearly 900 feet. Hundreds of natives were employed in digging out the sulphur and hundreds more in carrying 50-pound bags of sulphur to the railway terminus whence carriers where sent rapidly to the storehouse on the bay The first shipment of sulphur sent to France paid handsomely, but the company suddenly left the field, giving as a reason that malarial fever of a malignant type made it impossible for white men to live on the mountain island.

It was eventually stated, however, that the company had learned that the administration of the New Hebrides was not in a position to guarantee the company a monopoly, a prior right from an Australian engineer, the original discoverer of the commercial possibilities of the island, being in existence. To-day this claim holds good, but Condominium law prevents any prompt commercial activities on the island. A British-Australian company is now endeavoring to begin operations, and has opened up negotiations with the Condominium government.



Entrance to the New Wet Dock

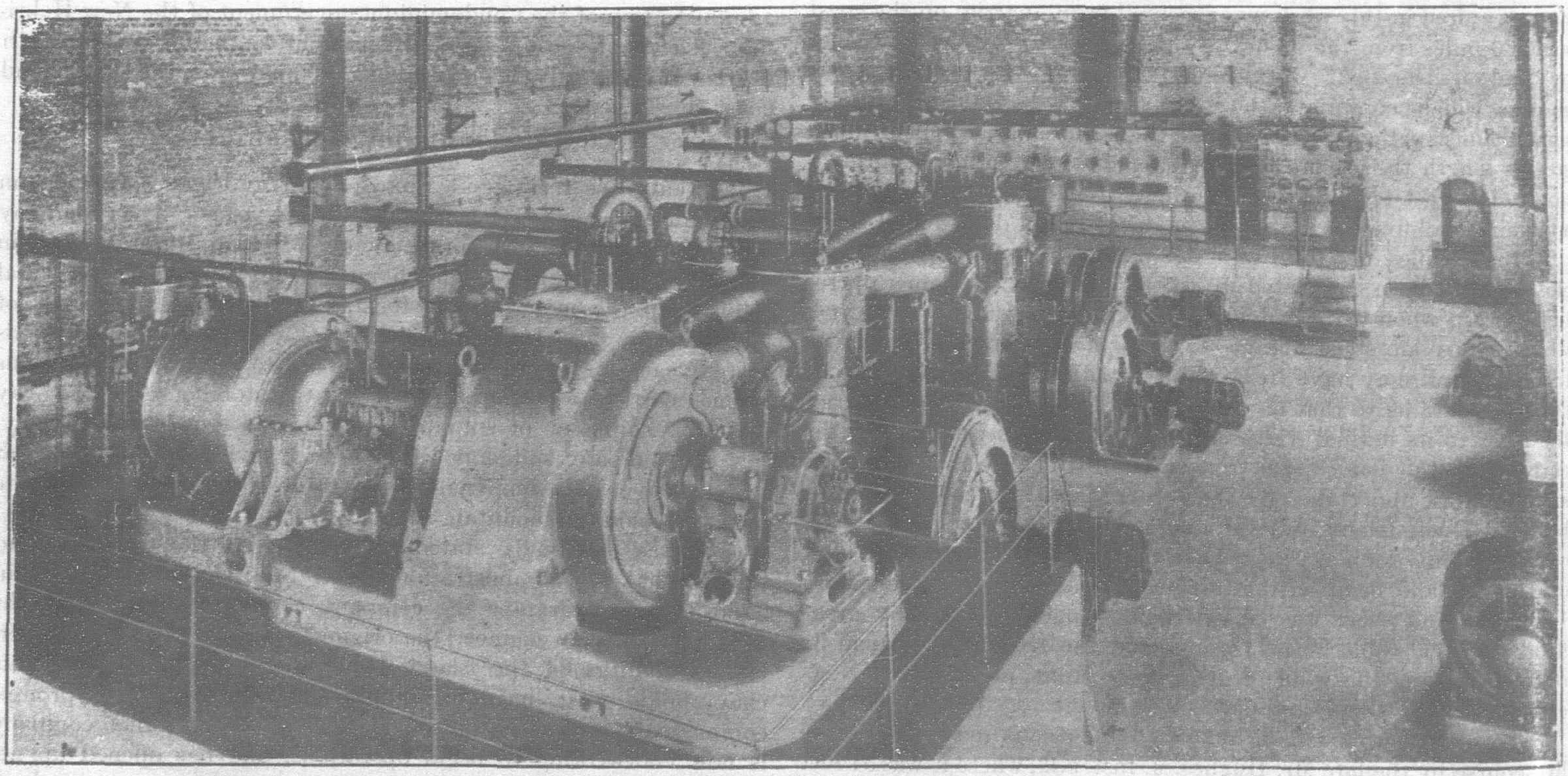
The Singapore Harbor Works

WITH Germany vanquished and India released from the menace of an attack from the west, Singapore becomes the Gateway of Empire, the Gibraltar of the East, the logical headquarters of the British Fleet in the Pacific, the stopping place of all the great lines of passenger and cargo carriers that ply between Europe and Eastern Asia. It is a great harbor with a great history, rivalling Hongkong in its growth, importance and in the magnitude of its improvements. The report and accounts of the Singapore harbor board for the year ending June 30, 1921, just to hand, conveys some idea of the advances made in the traffic and revenues of the port. The gross revenue was $17,493,295; the total tonnage of vessels using the wharves was 5,242,356, about 400,000 tons increase over the preceding year, but less by more than a million tons that of the year 1912, the high water mark of the board in tonnage. The tonnage of cargo handled showed a slight increase over the previous year, but again much less than in 1912.

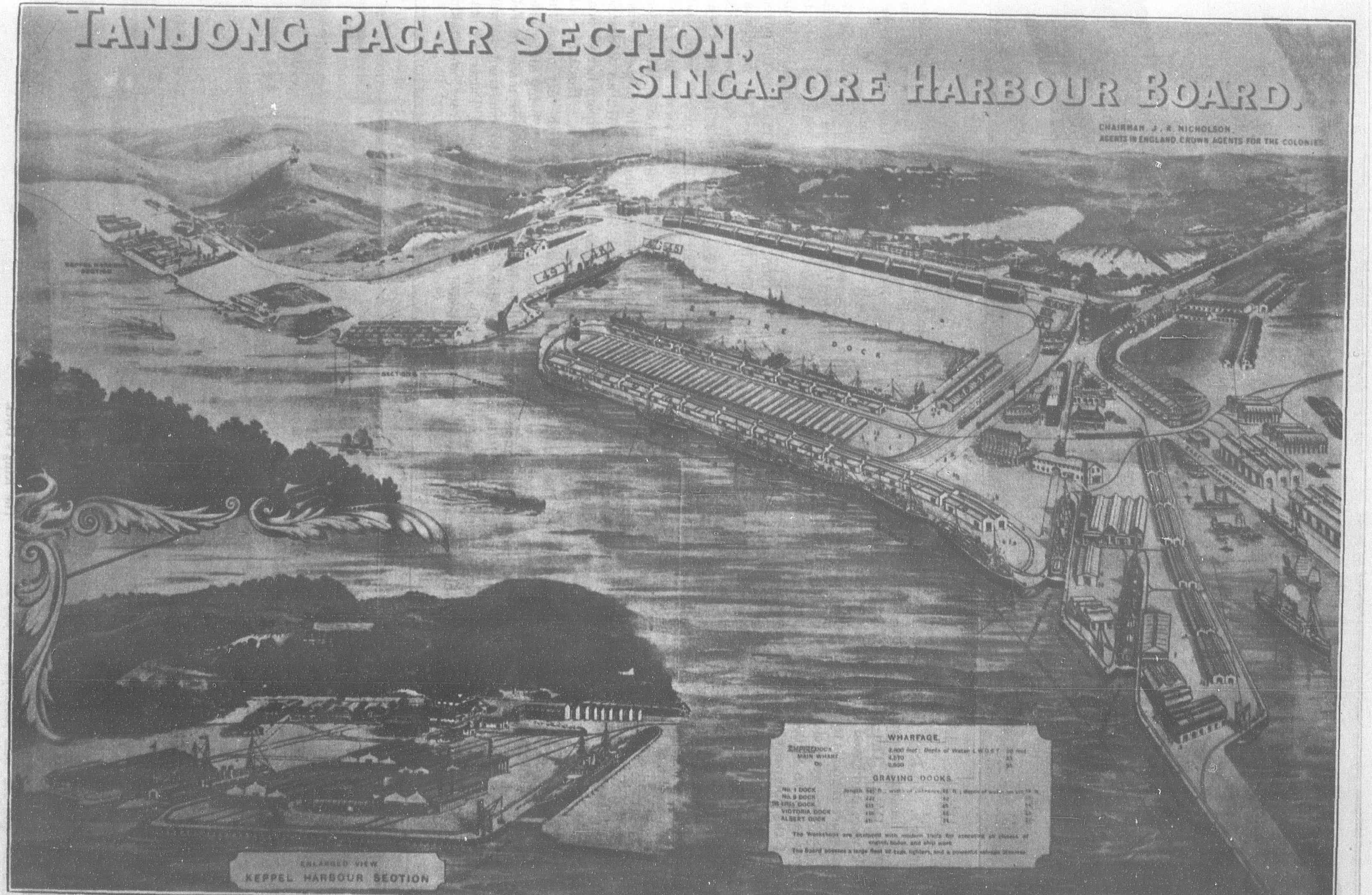
The history of the harbor is the history of Singapore and instead of attempting to give our readers an idea of this great work from the dry statistics of the reports and publications of the harbor authorities, we reproduce extracts from a most excellent and up-to-date description that appeared some time ago in our contemporary, *The London and China Express*, from the pen of Mr. J. R. Nicholson, C.M.G.

As was pointed out in Mr. Nicholson's article, its steady development has been largely due to the enterprise of the Tanjong Pagar Dock Co., formed in 1863. The first proposition was for the construction of a graving dock 550-ft. long with 65-ft. of width of entrance and with 23-ft. of water on the sill. An engineer was engaged in England, who arrived in Singapore in September, 1865, and work actively proceeded on a dock 450-ft. long, which was opened in October, 1868, as the Victoria Dock. The capital of the company was $300,000, the heavy outlay necessary for the completion of the dock being obtained by the issue of 10 per cent. debentures. In 1870 the company leased, in conjunction with the Patent Slip and Dock Co., the Bon Accord Dock. In 1876 the construction of another dock was commenced under Mr. Jackson as engineer, and opened as the Albert Dock in 1879. This dock is 496-ft. long, with 59-ft. width of entrance and with 21-ft. of water on the sill. In the early eighties the directors were much exercised in their minds as to how to deal with the growing tonnage. A railway connection between Tanjong Pagar and the town was proposed in 1866, but fell through. In 1872 a 4-ft. 8½-in. gauge line was laid behind the wharves, worked by horses, but was abandoned. Another large graving dock was proposed in 1885, but the scheme did not meet with success.

In 1885 a large addition was made to the property and wharfage by the purchase of the Borneo Company's property adjoining



Electric Power Station, Singapore Harbor Works



WHARFAGE.

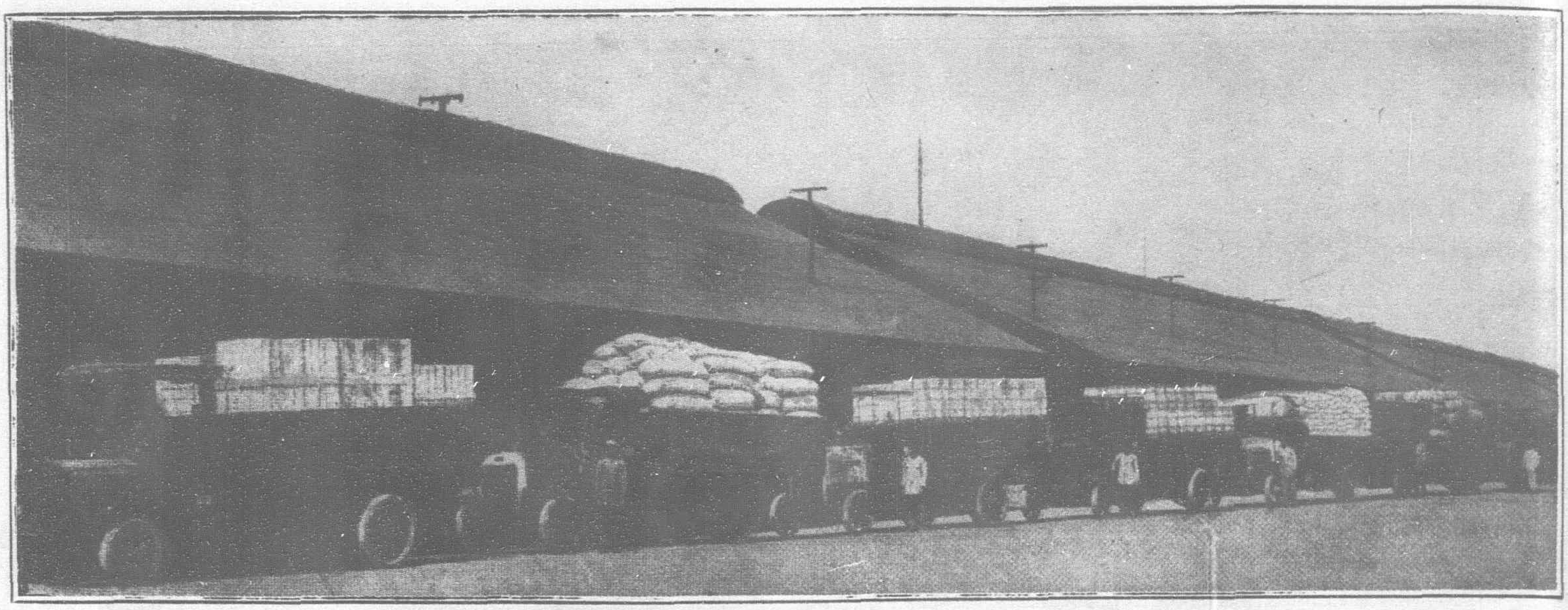
EMPIRE DOCK	[illegible] feet; Depth of Water L.W.O.S.T.	[illegible] feet
MAIN WHARF	[illegible]		[illegible]
Do	[illegible]		[illegible]

GRAVING DOCKS.

No. 1 DOCK	length [illegible] ft.;	width of entrance [illegible] ft.;	depth of water on sill [illegible] ft.
No. 2 DOCK	[illegible]	[illegible]	[illegible]
[illegible] DOCK	[illegible]	[illegible]	[illegible]
VICTORIA DOCK	[illegible]	[illegible]	[illegible]
ALBERT DOCK	[illegible]	[illegible]	[illegible]

The Workshops are equipped with modern tools for executing all classes of engine, boiler, and ship work.

The Board possess a large fleet of tugs, lighters, and a powerful salvage steamer.

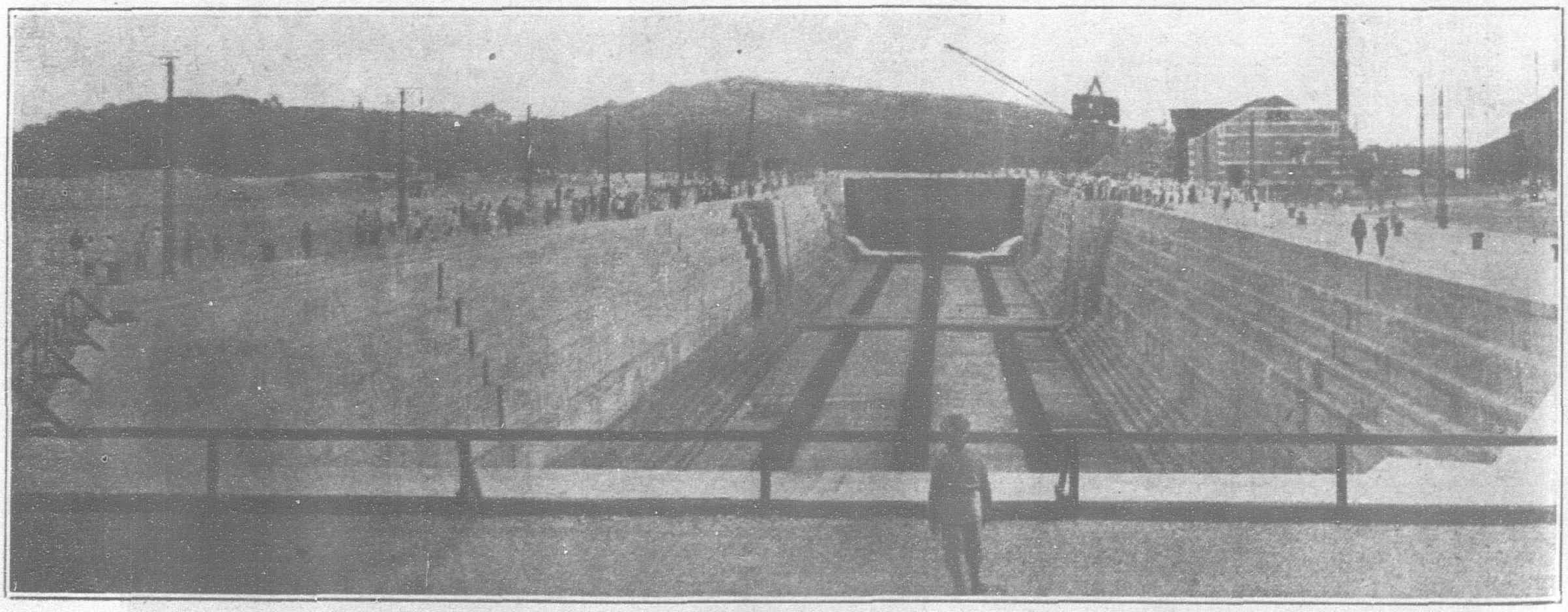


Present Method of Transporting Cargo from the Wharves to Town

that of the company's. In 1889 the company extended its operations to Penang by leasing, in conjunction with the New Harbor Dock Co., the Prye Dock. The Singapore Tramway Co.'s lines and rolling stock were purchased in 1889, mainly with the object of facilitating transport of goods to town, but as the business proved unremunerative the lines were closed in 1894. In 1899 the company's capital was raised to $3,000,000, a sum more in accordance with the value of the company's assets than its original capital. In the same year the company purchased the New Harbor Dock Co.'s undertaking, the Prye Dock at Penang being also taken into the fold. The directors since 1874 consistently bought up land adjoining their own property, a policy which afterwards not only proved of benefit to the company, but allowed for the carrying out of the new extension works of the government at much less cost and freedom of design than otherwise would have been the case.

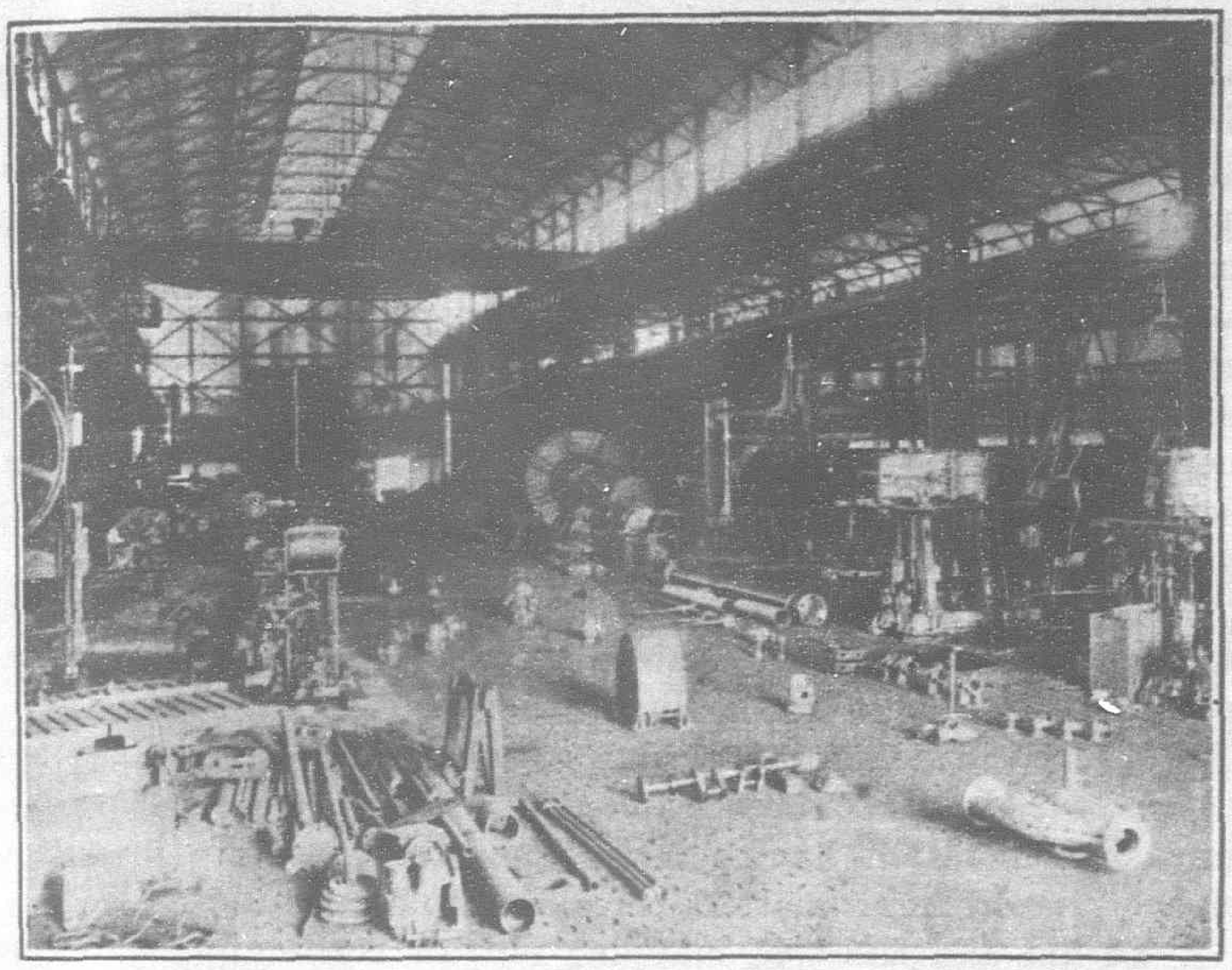
During the 'nineties it became very evident that the shipping facilities provided at Tanjong Pagar were totally inadequate to meet the growing requirements. Various schemes were evolved to remedy matters. Proposals to extend the wharfage to the east alternated with the idea of dredging to allow wharves behind the existing wharves. A dredger was contracted for to carry out the latter idea, but on its delivery it was put to work on the eastern scheme dealing with a material for which it had not been built and was unfitted for. In 1904 a scheme for the reconstruction of the wooden wharves in permanent material and the construction of a wet dock was approved by the directors, but as this scheme involved the expenditure of a sum three times that of the company's capital, differences arose as to how the money was to be raised. The difficulty was solved by the colonial office deciding to expropriate the company's property on behalf of the Straits Settlements government, and that failing a settlement as to the value the question to be decided by arbitration. An ordinance to give effect to this decision was passed by the legislative council in Singapore on April 7, 1905. An offer was made by the government of $240 per share, which not being accepted the value was determined by an arbitration court sitting in Singapore in October, 1905. The court's award was given on July 4, 1906, for $28,453,554, an amount which, after all liquidation expenses were paid, gave each shareholder $761.76 per share. This award raised the capital liabilities of the new owners by ten times that of the old company.

From July, 1905, the management of the property was vested in the Tanjong Pagar dock board. In 1912 an ordinance was passed constituting the board as the Singapore harbor board and definitely defining its duties and jurisdiction. This same ordinance created the "Penang harbor board," with very much the same powers as the Singapore board, both boards being under one chairman as the executive head. A contract was made in February, 1908, with Messrs. John Aird & Co. to construct a wet dock and reconstruct the main wharf at Tanjong Pagar. Towards the end of 1909 the board cancelled their contract, and, taking over



The King's Dock

their plant, continued the work, until a new contract was entered into with Messrs. Topham, Jones and Railton to complete the work, which they successfully carried out, the first vessel to enter the dock being the s.s. *Valdura*, on June 2, 1914. The wharf reconstruction was finished on May 24, 1917. This—the Empire Dock—covers an area of 24½ acres, with a depth of water at low water ordinary spring tides of 30 feet. The quayage at this depth being 3,522 feet in length, the dock is so designed that it can be increased to 35 acres in area, with 5,734 feet of deep-water quayage, and the depth to 33 feet. The width of the entrance is 150 feet.



Keppel Harbor Works—Machine Shops, Large Tool Bay

The dock walls are of solid concrete. The width of the quays is 35 feet. The material removed in the excavation of the dock was sufficient to reclaim over 150 acres of swamp land, which will prove a valuable asset in the future. The old timber wharves westward of the Victoria Dock have been demolished and replaced by two wharves—"Main Wharf," 3,152 feet long from the Victoria Dock entrance to the entrance of the Empire Dock, and the "West Wharf," 1,260 feet long from the Empire Dock entrance to "Jardine Wharf." These two wharves are built of solid concrete block walls to above low-water mark, and to quay level in solid concrete. There are two short sections of these wharves of different construction owing to the great depth at which a solid foundation was found, one section being of iron cylinders filled with concrete supporting a troughed steel decking overlaid with granolithic concrete, the other being of ferro-concrete construction. The quays are 45 feet wide, giving ample space for the handling of cargo, railways, etc. All quays slope at an incline of 1 in 60 back from the coping through the godowns to the loading platforms. This slope brings the loading platform on the same level as the floor of railway trucks and carts. The standard godowns are 200 feet long by 100 feet wide, well ventilated and with an overhanging roof on both sides, that on the wharf side giving cover to rough cargo, and on the other side affording cover for loading or discharging trucks. The cost of the works comprised in the wet docks and wharf reconstruction amounted to $18,886,225.

On January 1, 1909, another contract was made with Messrs. Topham, Jones and Railton for the construction of a large graving dock, completed and opened as the "King's Dock" on August 26, 1913. This dock, the largest in the East, is 879 feet long, and by placing the caisson in the outer step the length is increased to 895 feet, the entrance being 100 feet wide, depth of water on the sill 34 feet. It is divided into two by a caisson, so that, if necessary, a vessel of 500 feet long requiring a length of time in the dock can be placed in the inner portion, leaving the outer portion for use of vessels up to 346 feet in length. The outer and inner caissons are interchangeable. These caissons weigh 826 tons each.

Prior to its construction the greater part of the area was covered by water at high tide, so that the first operation was to dry the site. A watertight embankment was run out from the shore. In continuation of this bank, a cofferdam was driven enclosing the seaward end of the dock and joining in with the existing reclamation to the westward. The area enclosed was cleared of water and excavation commenced. The material derived from the excavations was used for filling up and raising the general area of the ground around the dock. The emptying culvert for the inner dock is carried through the body of the west wall, and thence to the pumping station installed a short distance inside the outer entrance and adjoining the west wall of the dock. The corresponding culvert for the outer dock is carried directly across from that dock, and filling culverts are provided in each wall at both the inner and outer entrance.

The dock is constructed of concrete, with Cornish granite ashlar entrances. Three rows of keel blocks are provided. The pumping plant consists of two sets of compound engines driving two 60-inch pumps, supplied by Messrs. J. and H. Gwynne & Co., of London. This plant is capable of emptying the dock of its 22,000,000 gallons in less than two hours, approximately at the rate of 820 tons per minute. The main pumps consisted of two "Invincible" centrifugal pumps, having double suction pipes 42-in. diameter, and single discharge pipes, 60-in. diameter, driven by vertical direct-acting compound engines, working at 150-lb. pressure. It was required of the pumps that they should together be capable of emptying the dock in three hours. As a matter of fact, at the time of the trials, this was accomplished, as we have mentioned, in less than two hours. Each pump is provided on the discharge side with a sluice valve actuated by an electric motor, these sluices being in addition to the non-return valves already referred to. For drainage purposes, two 12-in. centrifugal pumps are used, each being capable of delivering 2,500 gallons per minute against a head of 50-ft. of water. These pumps are driven by electric motors. The capacity of the dock at high water is about 3,570,000 cub. ft., the total lift from the dock bottom at high water being about 39-ft. to 54-ft. The foundations of the engine-house consist of Portland cement concrete carried well down into the shale. The two emptying culverts, to which reference has already been made, are led into a main sump running the whole length of the engine house, and formed in the concrete base. The centre of the engine-house is in the form of a deep well, in which the pumps are placed, the pump suctions being carried down through the concrete into the main sump. As a necessary precautionary measure an asphalte damp-course is provided below the floor of the engine-house, and continued up the back of the walls, so as to prevent the moisture percolating into the well, for it will be noticed that the floor of the well is considerably below the level of low water. The face of the well is lined with white glazed brick, for cleanliness, and also to give light.

The discharges from the pumps are formed of cast-iron segments, built into the concrete. They lead from the pumps into a chamber situated immediately outside the engine-house, the discharge outlets into this chamber being provided with non-return valves. A large culvert is laid from the further side of this chamber, which finally discharges into the harbor outside the outer entrance through the western-wing wall. Between the two main pumps are a pair of drainage pumps with suction and discharge pipes.

Immediately adjoining the engine-house is the boiler-house. In order to save expense in foundations, this building is carried throughout upon bearing piles driven down to the shale. Three Babcock and Wilcox water-tube boilers have been provided, and space is left in the boiler-house for another set if this should be required hereafter. The working boiler pressure is 160-lb. Superheaters and an oil eliminator are also provided. In connection with the boilers, an induced-draught plant has been introduced. As previously mentioned, two caissons have been provided. They consist of steel plating supported by angle-steel frames, these being stiffened and strutted as required, and the top surface of each caisson is decked over to form a roadway, being also provided with rails for railway traffic. A 15-ton traveling electric crane serves one side of the dock, and a 5-ton the other. The dock is well provided with capstans of 10 and 5 tons capacity, electrically driven, as are the motors operating the penstocks. The cost of this dock and equipment amounted to $3,697,000.

In close proximity to this dock are two others, formerly the property of the New Harbor Dock Company. One was reconstructed in 1907, being 380-ft. long, 45-ft. width of entrance, with 14-ft. of water on the sill; the other being 463-ft. long, with 64-ft. width of entrance, and 17-ft. of water on the sill. The workshops attached to these docks have been entirely reconstructed, and are fitted with suitable machinery for dealing with the heaviest repairs to large vessels. All machines are electrically driven, as is all machinery throughout the property, with the exception of the large pumps of the "King's Dock." The electric power station contains a turbo-generator of 1,200 kw. capacity, also three high-speed triple-expansion sets, two of 400 kw. each and one of 200 kw. Superheated steam is supplied by three high-capacity Babcock and Wilcox water-tube boilers. Mechanical-induced draught can be used in the case of any sudden demand of increased power being called for.

The whole extension and reconstruction scheme has been laid out with a view of expansion as the demands of the future may require, there being ample room and strength to carry larger godowns and the erection of any mechanical device for labor-saving. The present godown floor area at Tanjong Pagar being nearly 20 acres, there is storage space available for 200,000 tons of coal. Eleven miles of railways and 13 miles of roadways connect the various sections. The main roads are 75-ft. wide, and the railways connect with the Malay States railway system, so that it is now possible to send loaded trucks from the ship's side at Tanjong Pagar direct to Bangkok. Designs have been prepared for a coaling wharf 1,200-ft. long, to be fitted with mechanical appliances for dealing with coal cargoes and bunkering, but owing to the exigencies of the war its construction has been postponed.

In 1907 a contract was let by the government to Sir John Jackson, Ltd., for the construction of wharves, with a protecting breakwater 5,650-ft. long, at Teluk Ayer. The original contract was for a continuous line of wharf 4,990-ft. long, but during construction the design was altered to allow of a boat harbor behind this wharf. This contract has been completed, with two wharves 1,570-ft. and 2,500-ft. respectively in length, with an opening between to the boat harbor, the depth of water alongside these wharves to be 18-ft. at low water spring tides on the sea side, and 7-ft. in the boat harbor. The completion of the boat harbor has been postponed on account of the difficulty in dredging work due to war contingencies. This harbor will be 18 acres in area, the sides to be finished in steps so as to facilitate the loading and unloading of lighters at any state of the tide. Seventy acres of land have been reclaimed by these works, and it is regrettable that the necessity of postponing the dredging has prevented the building of godowns on this area (which are so much required) owing to the danger from settlements which will inevitably occur on some parts of it during the operations. When completed this scheme will afford a great relief to the river traffic, much congested at present, but which cannot be relieved except at a cost of works to prevent silting out of all proportion to the results achieved.

Aircraft Chamber of Commerce

ORGANIZATION of the aircraft industry into a national body known as the Aeronautical Chamber of Commerce of America, with approximately 100 charter or founder members embracing the designing, constructing, operating and kindred elements and representing virtually every section of the United States has been been brought about through the initiation of the Manufacturers Aircraft Association. Among other things, it will develop the market and increase the use of flying machines among civilians, corporations and transportation companies.

The aircraft industry thus follows the example of all other modern industries which owe their resent greatness in no small measure to the trade association. Organization of the Aeronautical Chamber of Commerce, following as it does the creation of the Bureau of Aeronautics in the Navy Department, and provision, in the Wadsworth-Hicks Bill for a Commissioner of Civil Aviation in the Department of Commerce, and the nationalization and extension of the Aero Club of America, completes the accomplishments for the year and establishes the machinery whereby, it is believed, the development of American aviation will be greatly hastened.

The Aeronautical Chamber of Commerce of America is incorporated under the laws of the State of New York. Among its aims and purposes, as set forth in the Charter, are :.

To foster, advance, promulgate, and promote trade and commerce, throughout the United States, its territories, possessions, and in foreign countries, in the interests of those persons, firms or corporations engaged in the business of manufacturing, buying, selling and dealing in aircraft, aircraft motors, and aircraft parts and accessories of every kind and nature.

To diffuse among its members accurate and reliable information as to the standing of its members and those persons, firms or corporations engaged in similar lines of business.

To procure uniformity and certainty in the customs and usages of trade and commerce among its members and those persons, firms or corporations having a common trade, business or professional interest in all matters pertaining to aeronautics.

To aid and assist in mapping out air roads and lanes; the location of landing fields, airdromes, hangars, or such other structures as may be necessary for the advancement of aeronautics.

To advocate and promote in every lawful way the enactment of just and equitable laws pertaining to aeronautics.

To settle, adjust and arbitrate any and all differences which may arise between its members, and persons, firms or corporations dealing with them.

To promote a more enlarged and friendly intercourse between its members and persons, firms and corporations engaged in the business of, or dealing in aircraft, aircraft motors and aircraft parts and accessories, and generally to do every act and thing which may be necessary and proper for the advancement of the aeronautical art and industry and the accomplishment of the objects and purposes hereinbefore set forth; provided, however, that nothing herein contained shall authorize this corporation to engage in any business for pecuniary profit.

The need for a central trade organization, including within its membership all of the responsible and permanent financial and professional interests in aviation in the country, has been felt for some time.

"The existence of the Manufacturers Aircraft Association partly met the need. Its work has been characterized by a broad public-spirited attitude toward the entire industry and has been effective, but its members were the first to realize that an organization limited simply to manufacturers of airplanes, having, primarily, a common interest in the exchange of licenses for the use of patents, could not hope adequately to give representation to the entire field.

"The new organization has taken over the offices and equipment of the Manufacturers Aircraft Association at 501 Fifth Avenue, New York City. The latter organization will continue to serve its members in handling the administration of the cross license agreement covering airplane patents. The Aeronautical Chamber of Commerce will assume and greatly extend all of the functions formerly handled by the older organization, including the collection and dissemination of information regarding aeronautical activities in this and other countries; the publication of the Aircraft Year Book; and the furnishing of special services to its members through its various departments and committees.

Rangoon Port Improvements

RANGOON, which is now the principal port in Burma, became a regularly established port in 1853. For many years afterwards a government flotilla was kept up for the conveyance of troops and government stores only on the Irrawaddy River, together with a dockyard and workshops in Rangoon for repairing the steamers and flats, etc. Both flotilla and buildings were taken over in 1864 by the Irrawaddy Flotilla Company, established in Glasgow, which has now a very large fleet of river craft.

Rangoon became the seat of local government in 1862. It had made but moderate progress as a port during the preceding ten years of British occupation. A lightship had been placed at the mouth of the river (in June, 1852), and a wooden wharf had been built in the port itself (in 1859). The earliest statistics readily available are for the official year 1861-62. In that year the receipts of the Rangoon port fund, including Rs. 5,174 wharfage, aggregated Rs. 60,072, "showing an increase of nearly 100 per cent. over the previous year"; and the expenditure amounted to Rs. 44,940, most of which was on account of establishments, stores and repairs to the lightvessel and boats. The number of vessels which entered the port in 1861-62 was 438, with a tonnage of 157,472, equal to 340 tons per vessel. The bulk of the trade at this time was coastwise, but few vessels entering the port direct from foreign countries; and most of the goods were landed on the bank of the river from cargo-boats. The value of the imports in the year above mentioned was Rs. 1,23,87,679, and of the exports Rs. 1,40,26,752, a total of Rs. 2,64,14,431.

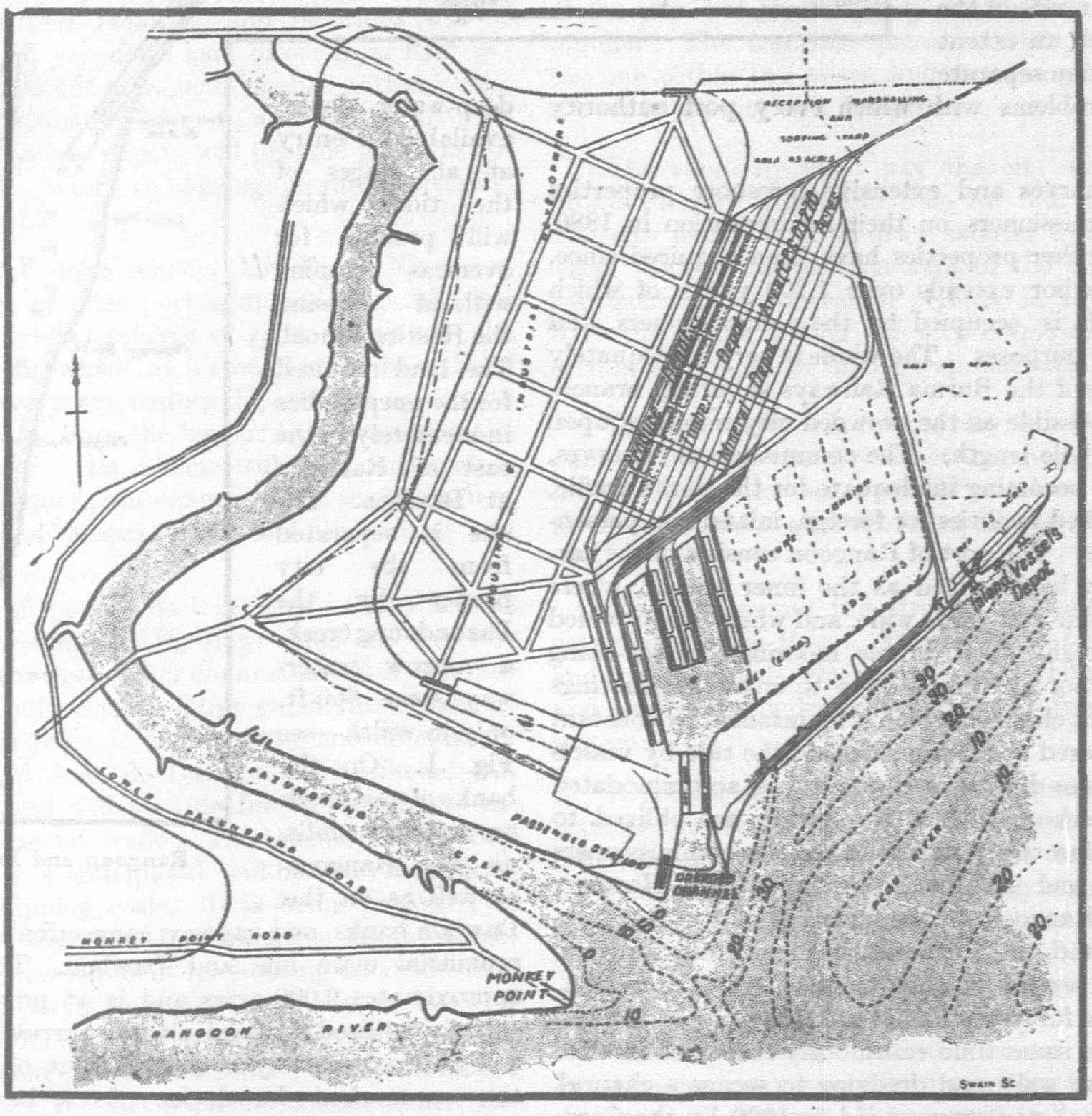


Fig 1. Plan of Proposed New Dock at Rangoon

The wharves and jetties were situated in the foreshore known as the Strand bank, which was supervised by the magistrate up to July, 1874, when it was placed in charge of the president of the Municipality. Almost all the revenue derived from it for about twenty-three years had been appropriated for the benefit of the town, a very small proportion having been expended on port improvement. In June, 1876, the management of the Strand bank, which was reserved from municipal limits under a special notification at the date of the inauguration of the municipality, was handed over to a committee consisting of the master-attendant, collector of customs and the executive engineer, and all the revenue collected was expended in providing accommodation for boats and in improving the foreshore generally. In June, 1878, the governor-general in council approved the proposal to create a trust, and a corporate body known as the commissioners for the port of Rangoon was formed with effect from January 1st, 1880.

When the commissioners took charge there were three fixed jetties and one pontoon jetty for the accommodation of sea-going steamers, there small fixed jetties for boat traffic, and two small jetties for passengers. For the inland traffic the Irrawaddy Flotilla Company had three small pontoon jetties, but there was no public jetty accommodation available. There were no moorings in the port. In 1880-81 the number of vessels entering the port was 874, of which 478 were steamers, 199 European sailing vessels, and 197 native craft with a total net tonnage of 598,303. In 1920-21 the number of vessels entering the port was 1,303 steamers and 398 native sailing vessels, with a total net tonnage of 2,300,513.

Statistics of the tonnage of goods landed and shipped in 1880-81 are not available, but the value of the trade of the port was Rs. 10,38,68,938. In 1920-21 the sea-borne trade aggregated 4,037,923 tons, while the value was Rs. 87,95,43,447. The export trade alone totaled nearly three million tons, whilst imports exceeded one million tons. In addition, there was continually expanding inland waterborne traffic, of which the Irrawaddy Flotilla Company has the greatest share, with its volume in 1920-21 of some 765,000 tons.

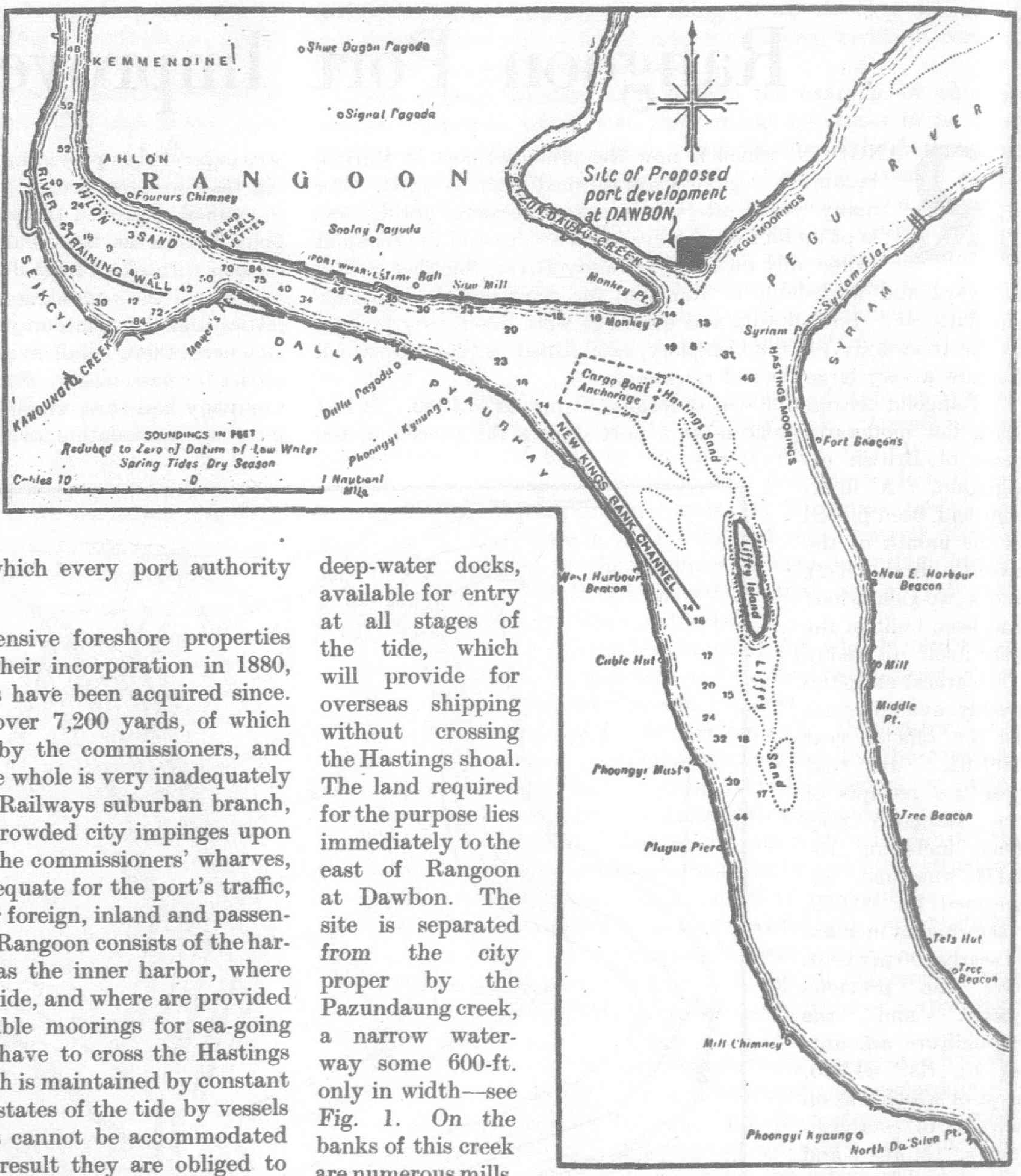
Mention has not hitherto been made of the immigrant traffic of the port of Rangoon to and from India. This is of a seasonal character, Burma being largely dependent on Indian immigrants for the bulk of her labor supply. The number of immigrant passengers through Rangoon exceeds 250,000 in each direction yearly, and complaints of poor treatment and of delays on arrival owing to medical and other inspections have been a subject of agitation for many years. Much of the trouble has been admittedly due to the inadequate landing arrangements provided in the port, and there is no doubt that the conditions for third-class passengers have been distinctly unfavorable.

The administration of the port is vested, under the Rangoon port act, in a representative public body, the commissioners for the port of Rangoon, which has as its present chairman Mr. J. A.

Cherry, C.I.E., M.L.C., barrister-at-law, who was appointed to that position in December, 1920. In its early days, the Rangoon port commission was administered by a vice-chairman; in 1901, Mr. (now Sir) George C. Buchanan, a civil engineer, became its head, combining the offices of chairman and chief engineer, and this was continued when, in 1915, Sir George Buchanan left for Mesopotamia, until Mr. Holmes retired in 1920. Mr. Cherry's appointment, as a man with business and port experience, marked the separation of the two offices of chairman and chief engineer. The business needs of the port have grown to such an extent that they demand attention separate from the engineering problems with which every port authority has to cope.

Certain existing wharves and extensive foreshore properties were vested in the commissioners on their incorporation in 1880, and from time to time other properties have been acquired since. The foreshore on the harbor extends over 7,200 yards, of which approximately two-thirds is occupied by the commissioners, and developed for port traffic purposes. The whole is very inadequately served by the single line of the Burma Railways suburban branch, and improvement is impossible as the crowded city impinges upon the foreshore along its whole length. The commissioners' wharves, jetties and pontoons are becoming inadequate for the port's traffic, and improved and increased facilities for foreign, inland and passenger traffic are imperative. The port of Rangoon consists of the harbor proper, or what may be described as the inner harbor, where the Rangoon River is some 800 yards wide, and where are provided fourteen swinging and eight fixed double moorings for sea-going craft. To reach the harbor all vessels have to cross the Hastings shoal by the Monkey Point channel, which is maintained by constant dredging, and can be entered at certain states of the tide by vessels up to 33-ft. draft, but these deep vessels cannot be accommodated to that draft, in the harbor, with a result they are obliged to complete their loading below the Hastings, where the commissioners maintain five swinging and six fixed moorings. The Hastings shoal is situated below Rangoon at the junction of the Rangoon River, the Pegu River and the Pazundaung creek, and for very many years has been a serious menace to the port of Rangoon. Erosion of the river bank for years has been taking place, and the Hastings shoal has at the same time enormously increased in size. A project of river training walls and dredging to secure a channel through the Hastings shoal was propounded in 1920 by the Commissioners' consulting engineers, Messrs. Meik and Buchanan, which was estimated to involve an expenditure of approximately 2 crores of rupees. The scheme did no more than propose to safeguard the existing inner harbor (the accommodation in which is already overtaxed), and the costly acquisition of foreshore sites now in commercial occupation would have been necessary in addition to provide an extension of port facilities.

Since the war a number of proposals have been made in connection with the port's development, and these have culminated in what may be described as the present chairman's Dawbon dock scheme. Mr. Cherry's scheme of future port development, which has been approved by a government conference, by the port commissioners, and in its general aspects by the Burma chamber of commerce, is a complete departure from any attempt to meet the problem of expansion by continuing on past methods. While retaining all the existing accommodation in the harbor and remodelling it to better advantage, it is now proposed to construct deep-water docks, available for entry at all stages of the tide, which will provide for overseas shipping without crossing the Hastings shoal. The land required for the purpose lies immediately to the east of Rangoon at Dawbon. The site is separated from the city proper by the Pazundaung creek, a narrow waterway some 600-ft. only in width—see Fig. 1. On the banks of this creek are numerous mills, on the Rangoon as well as on the Dawbon banks, and railway connection already exists between the provincial main line and Dawbon. The area to be developed approximates 2,000 acres and is at present low-lying paddy land entirely utilized for agricultural purposes, which it is anticipated will be inexpensively acquired. Out of this area some 600 acres are ear-marked for docks. As a beginning it is proposed to construct fifteen berths for large foreign-going vessels. Expansion over the whole reserved area will eventually provide a total of forty-eight berths. Adjacent to the docks will be a large area for produce, timber and mineral depôts, whilst between the "port" area and the city of Rangoon there will be approximately 1,000 acres available for housing and general industrial development. The whole will be adequately served by rail, affording direct connection between the docks and the main railway system of the province. The scheme is primarily designed to provide for rail-borne traffic, but eventually every facility for all kinds of port traffic will be given.



Rangoon and Proposed New Dock Site

Two bridges are projected to connect Rangoon and Dawbon to carry tramways and vehicular traffic of every description. On the Pegu River side of the docks will be a depôt for inland vessels and for coal; the latter served by rail and by jetties for direct unloading and for bunkering by lighters. The outer entrance to the dock will serve as a tidal basin, in which the largest ships can lie in slack water before passing through the lock-way, and will be approached by a short dredged channel with a depth of 35-ft. at L. W. S. T. The entrance lock will have a width of 80-ft. to 100-ft., and, alongside, a dry dock capable of taking the largest ships ever likely to visit the port will be provided. On one of the quays at the outer entrance a passenger station will be erected and connected with the main railway system. In the immediate vicinity land will be available for workshop sites, and the commissioners propose to establish their own workshops and slipways in the neighborhood of the dock entrance.

The completion of the Dawbon dock scheme will at once set free much foreshore on the harbor that has hitherto been earmarked for traffic development, and it will be possible to give necessary relief to the congested Indian, coasting and inland waterborne traffic by utilizing the facilities that have had to be reserved for the foreign traffic. It will also be possible to make adequate provision without further delay for the immigrant passenger traffic of the port. The Dawbon dock scheme proposals will be in augmentation of the existing port facilities, and moorings will be maintained in the harbor of vessels to load direct from lighters; but the volume of rail-borne traffic in mineral, timber, cotton, grain, seeds, etc., for overseas will steadily increase and will be diverted to the docks, where the adjacent depôts will provide godowns for the occupation of merchants, where re-bagging, cleaning, pressing, etc., operations will be possible.

In connection with the dock scheme Mr. E. C. Niven, M. Inst. C.E., chief engineer of the port commissioners, has put forward proposals for a modified scheme of river training in the vicinity of the Hastings shoal, which, at a cost of some 30 lakhs of rupees only, will, within seven years, restore the area lost by erosion and will improve the channel into the harbor by contracting the width of the Rangoon River. His scheme will, it is anticipated, be all that is necessary for the maintenance of the inner harbor, and will be in substitution of Messrs. Meik and Buchanan's two crores project.

A noteworthy feature of the new dock scheme is that it avoids the necessity for vessels crossing the Hastings shoal and the cost of making and maintaining a deep-water channel across it and into the inner harbor, which would involve large expenditure without providing any new source of revenue or increasing accommodation in the port. It is estimated that the Dawbon dock scheme will more than pay for itself, and will provide for unlimited and inevitable expansion of provincial trade. The scheme will directly benefit the cultivator and, it is anticipated, will have an immediate effect in a reduction of shipping costs. It is being projected in close association with the Rangoon Development Trust, which, for its part, will undertake development for housing and industrial purposes. The Burma Railways Company is wholly in favor of the project, as it will provide for railway expansion in a manner quite impossible in the present port of Rangoon. The government conference, presided over by the development commissioner, expressed unanimous approval of the project after a very careful discussion. The port commissioners, meeting after the government conference, unanimously accepted the general scheme and have approved of the necessary preliminary works, such as land and river surveys, substrata borings, tidal and current observations, and the preparation of a provisional lay-out. These works are now actually in hand, but it is anticipated that two years must elapse before actual construction can commence, and that it will be seven or eight years before the new dock will be in such a condition as to receive shipping.

Mr. Cherry, who has had in the elaboration of his project the assistance of Mr. E. C. Niven and the co-operation of Mr. C. Morgan Webb, C.I.E., I.C.S., chairman, Rangoon Development Trust, and Mr. H. V. Lancaster, F.R.I.B.A., town planning expert, has, with courage, enterprise and foresight, produced proposals which, when completed, will, it is anticipated, place Rangoon in the select list of the world's best equipped, most efficient and most prosperous ports.—*The Engineer*.

Harbin Tramways

A TRAMWAY system for Harbin seems assured. There has been much backing and filling, and there have been times in the life of the franchise when it looked as if the whole plan would he declared off says the *North China Star*.

But now an American engineering firm has taken the contract, and makes the statement that a great part of the material necessary for the construction has already been purchased in the Uuited States. The track laying will begin in April, if the ground has thawed sufficiently by that time, and by the end of 1922, the cars will be running. There are grave engineering problems to be worked out, especially in crossing the Chinese Eastern Railroad, which it appears must be a job of tunnelling.

The franchise which has been granted is on its face all in favor of the city, but there may be jokers, with which the public is not familiar. The franchise provides that the company must build the line within two years, and thirteen years thereafter must turn it over to the city as a free gift.

The company must pay the city thirty percent of the net profits for nine years and then for four years thirty-five percent. The city names men to draw salaries from the company and has equal voice in the management of the company both during the construction and operating periods, in addition to which the city fixes the tariffs, giving the city employes free rides and naming certain groups which shall get special rates.

It looks pretty soft for the city, but that is not all. The company guarantees the city a net income from its share of the net profits during thirteen years of not less than three million eight hundred thousand gold rubles, or expressed in U. S. dollars, $1,900,000.

The city names the streets, and under what conditions the cars may run on them. The city gets for the use of its buildings and for the streets, electric current without profit to the company, and the company builds for the city free of charge a fire singal system.

A special system of lighting equipment is to be erected in the principal streets of the city without cost to the city. Moreover, the company will lend the city, at the date of signing the contract, a half a million gold rubles, without interest, to be repaid to the company out of the city's share of the net earnings. It may furnish amusement for some banker to figure the interest, and the compounded interest, that will be involved in this loan.

The explanation of all this seems to lie in the fact that a Japanese company was in the market for the tramway franchise and the Chinese company that secured it had to do some grand and lefty promising in order to keep their competitors out. The Japanese have an electric light contract with the city, and have an extensive system of wiring and poles on the Harbin streets.

The Japanese company that was after the franchise has filed a protest against the awarding of the contract to the Chinese, and it is provided that the electric light company will have to remove its poles from the city streets in order that the new concern may erect its equipment, and begin furnishing the city with light and transportation. The Japanese electric light contract is said to be terminable upon notice from the city.

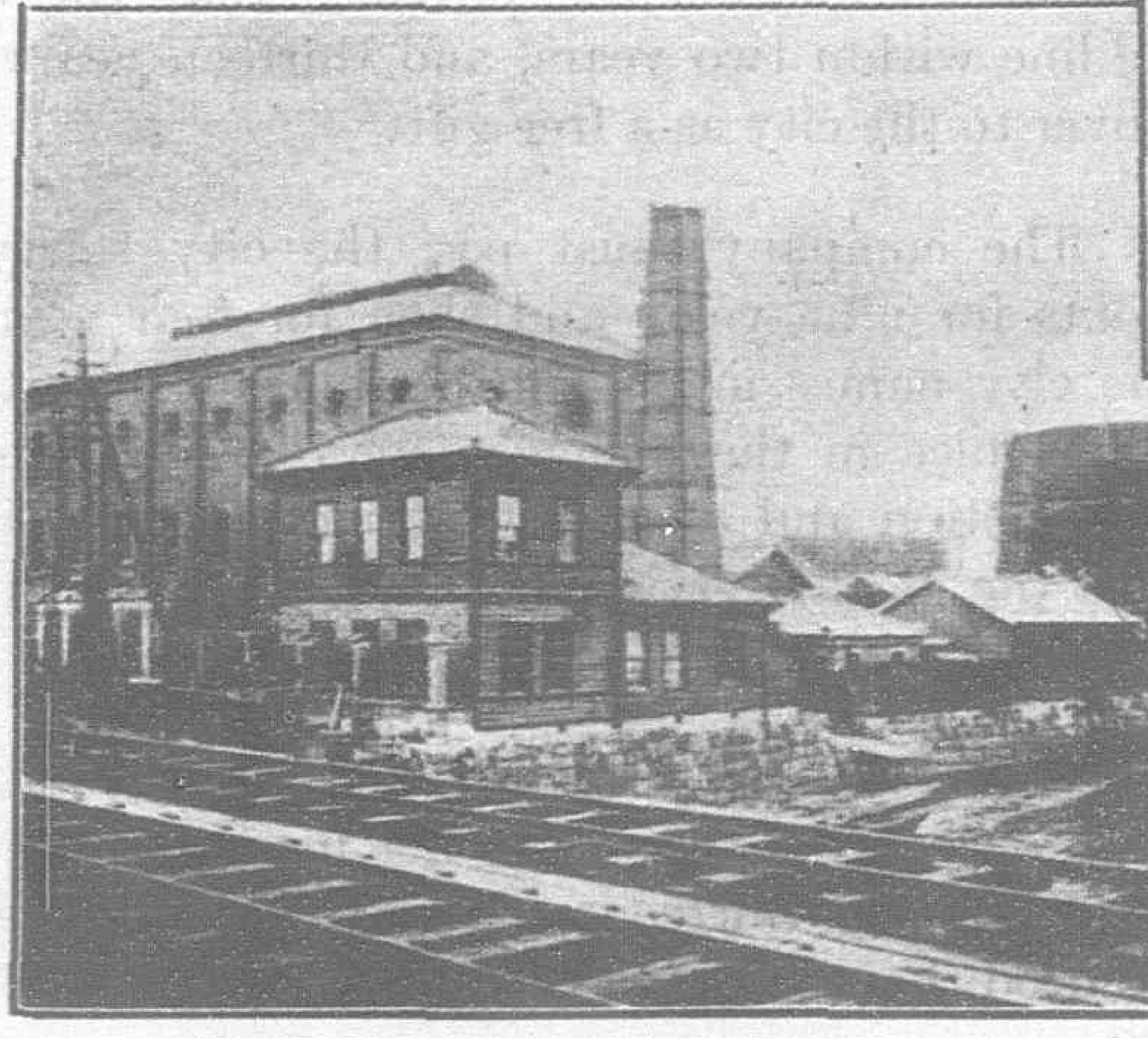
The entire situation seems fraught with opportunities of litigation, and with the apparent lack of definite knowledge of the lines of demarkation between the jurisdiction of the courts in this three cornered administered municipality, the legal fur will probably begin to fly in the near future. There may even be international complications.

Gas Industry in Japan

At the end of 1920 there were 81 companies in all Japan which supplied gas, or gas together with electricity. The total investment in these industries was Y.254,987,000. They consumed 774,626 tons of coal in 1920, and produced 10,153,169,957 cu. ft. of gas, sold to 493,036 houses.

In 1889 there were only two gas companies in Japan. Their capital paid up was only Y.310,000, and they supplied only 1,049 houses with 91,000,000 cu. ft. of gas. By 1905 the number of companies had increased to seven, in which Y.7,900,000 was invested and they supplied 37,679 houses, with 883,000,000 cu. ft. of gas.

The investments in gas companies increased rapidly after the Russo-Japanese war, and in 1910 there were ten companies operating, capitalized at Y.27,580,000 paid up, which supplied 117,616 houses with 3,546,000,000 cu. ft. of gas.


By-Products Works of the Tokyo Gas Co.

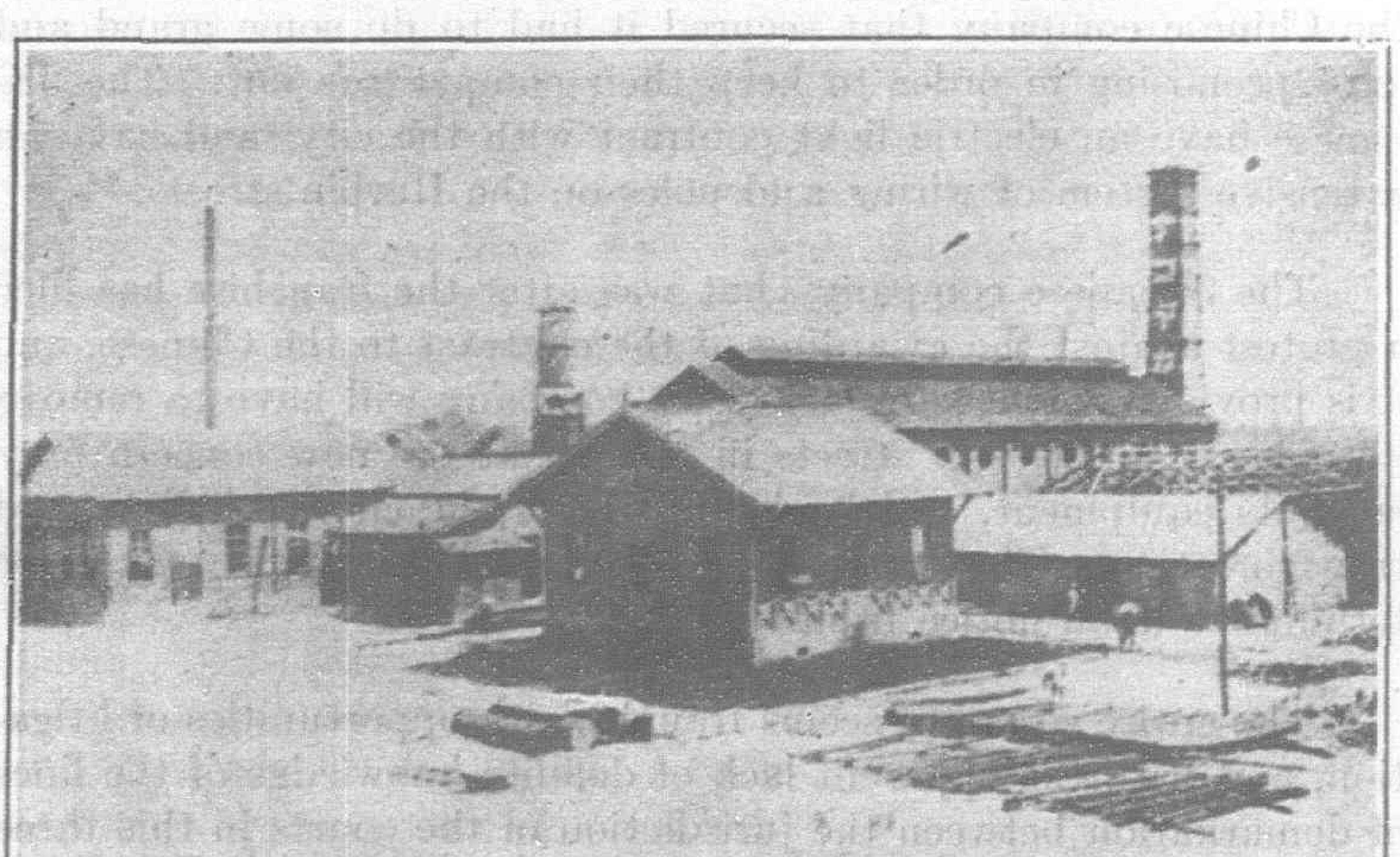
Reach Country Districts

From 1910 to 1912 the extension of gas works to small country districts had been greatly developed and in 1912 there were 74 companies in which the total investment was Y.52,630,000, supplying 4,360,000,000 cu. ft. of gas to their consumers.

In 1915, at the end of March, the number of companies had increased to 87, capital invested to Y.80,790,000, and the quantity of gas supplied to 5,327,000,000 cu. ft. The later progress of the industry is shown in the following table :—

Year 1916	No. of companies	Capital Yen	Gas supplied cu. ft. Yen
March 31	91	86,870,000	5,435,000,000
1918	72	109,270,000	7,919,000,000
1919	82	unknown	9,420,000,000
December 31, 1920 ..	81	154,990,000	10,153,000,000

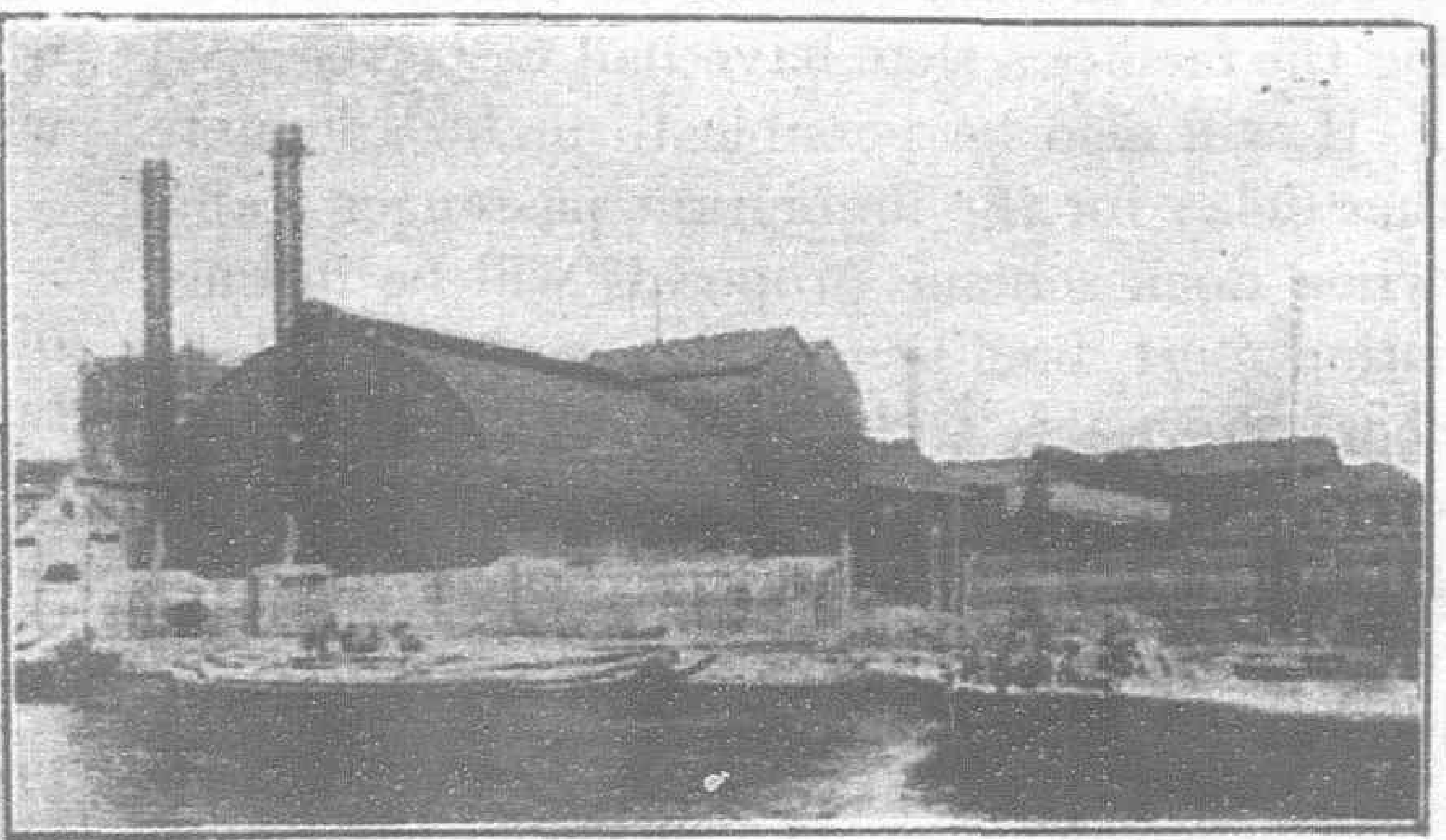
supplying 493,036 houses.


The Nagoya Gas Works

From these figures it can be seen that the expansion of the gas-producing industry has been extraordinary especially from 1908 to 1919.

Used for Power

The end of the Russo-Japanese war witnessed a boom in the promotion of industries and with the rise of new factories all over the country, the demand for gas increased for use in engines. At the same time demand for better lighting grew and gas became more and more popular. Naturally in all the important industrial centres the gas industry expanded, and between the two years 1910 and 1912 the investment in gas companies doubled, while the number of companies producing gas increased 700 per cent.


The Senji Works of the Tokyo Gas Co.

Post-War Projects

Since the Russo-Japanese war (say 1906) the important new gas companies that have been organized are :

Name	Year Organized
Kyoto Gas Co.	November 1909
Nagoya Gas Co.	November 1906
Hiroshima Gas Denki Co.	October 1910
Chosen Gas Co.	October 1910
Bishu Denki Co.	April 1909
Chida Denki Co.	February 1910
Nara Gas Co.	December 1910
Okazaki Gas Co.	April 1910
Shizuoka Gas Co.	June 1910
Akashi Gas Co.	May 1912
Fukuyama Gas Co.	December 1911
Toyohashi Gas Co.	October 1909
Wakayama Gas Co.	April 1911
Sakai Gas Co.	March 1910

Besides these important companies small scale concerns were established all over the country. At the same time there was a conspicuous expansion of electric light companies. Demand for light was increasing, and another reason was the very profitable showing all the old-established companies had been making for years past.

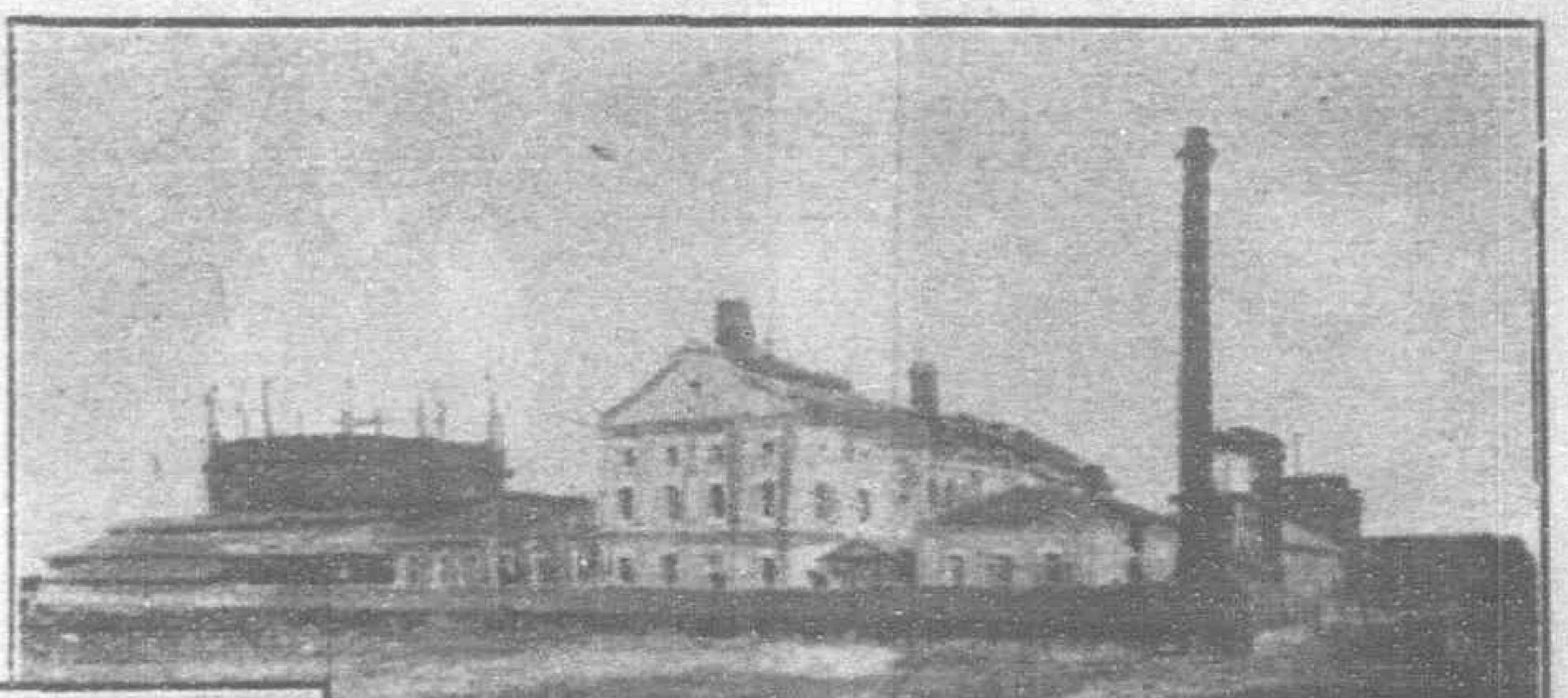
For instance the Tokio Gas Company, established in 1900, and the Osaka Gas Company, established after the Russo-Japanese war, had always shown net profit of 18-20 per cent. on the money invested. In those times before the European war 18-20 per cent. net profit on paid-up capital was considered a splendid investment return, and naturally that high rate of profit attracted universal attention from the investing classes.

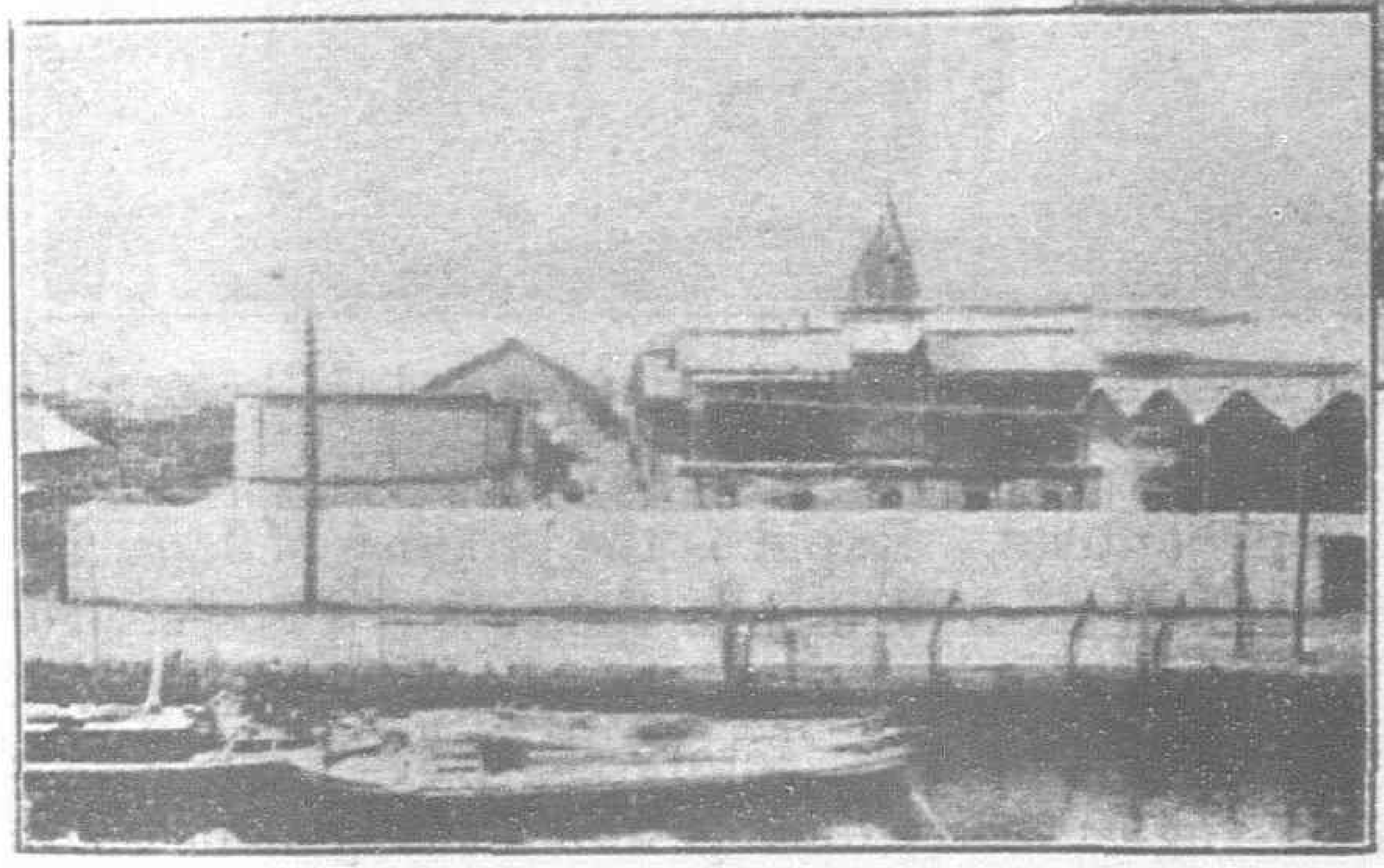
Popular on Market

One of the results of this was to make the shares of the Tokyo Gas Company very popular on the stock exchange, and to place them in the front rank of speculative shares, along with Kanegafuchi Boseki, Tokyo Dento, and the stock exchange shares themselves. And this popularity on the stock exchanges, reacted on the promotion field and made the promotion of gas companies very popular indeed.

Osaka Gas Tank

Osaka Gas Works


The Fukugawa Works of the Tokyo Gas Co.


The Shiba Works of the Tokyo Gas Co.

With 1912 the first period of expansion of the industry seems to have come to an end. But after the beginning of the European war a second period of expansion set in, while new companies were again promoted. But with the war the price of coal began to advance and this made the industry more difficult to operate at a profit. Before the war coal was usually Y.50 per 10,000 *kin* (13,333-lb.), but in 1917 it rose to Y.160 and in 1919 it was Y.230,240. During and after the Russo-Japanese war the price of coal rose 60 per cent., but during the European war it rose 200 and even 300 per cent. in price.

Gas companies are public service corporations, and most of them had contracts with municipalities, and country districts for selling certain fixed amounts of gas for long periods at a fixed price. Naturally these contract prices could not be increased. So newly established companies without any reserves, found themselves in difficulties from which they were unable to extricate themselves. While the old established companies were much upset, they were able to go on existing from the sale of their by-products, which were selling at enormously high prices.

Reforms at Osaka

Recently the charges made by the Tokyo Gas Company and the Osaka Gas Company, have been the targets for attacks demanding reforms. These companies had city contracts, and in Osaka in order to get permission to raise the price of gas to Y.3.00 per 1,000 cu. ft. the company was obliged to submit to certain conditions imposed upon its future operations. The number of houses supplied must be increased 500 monthly: the amount of gas mains laid must be increased in proportion and from September 1 no charge for metres was permitted.

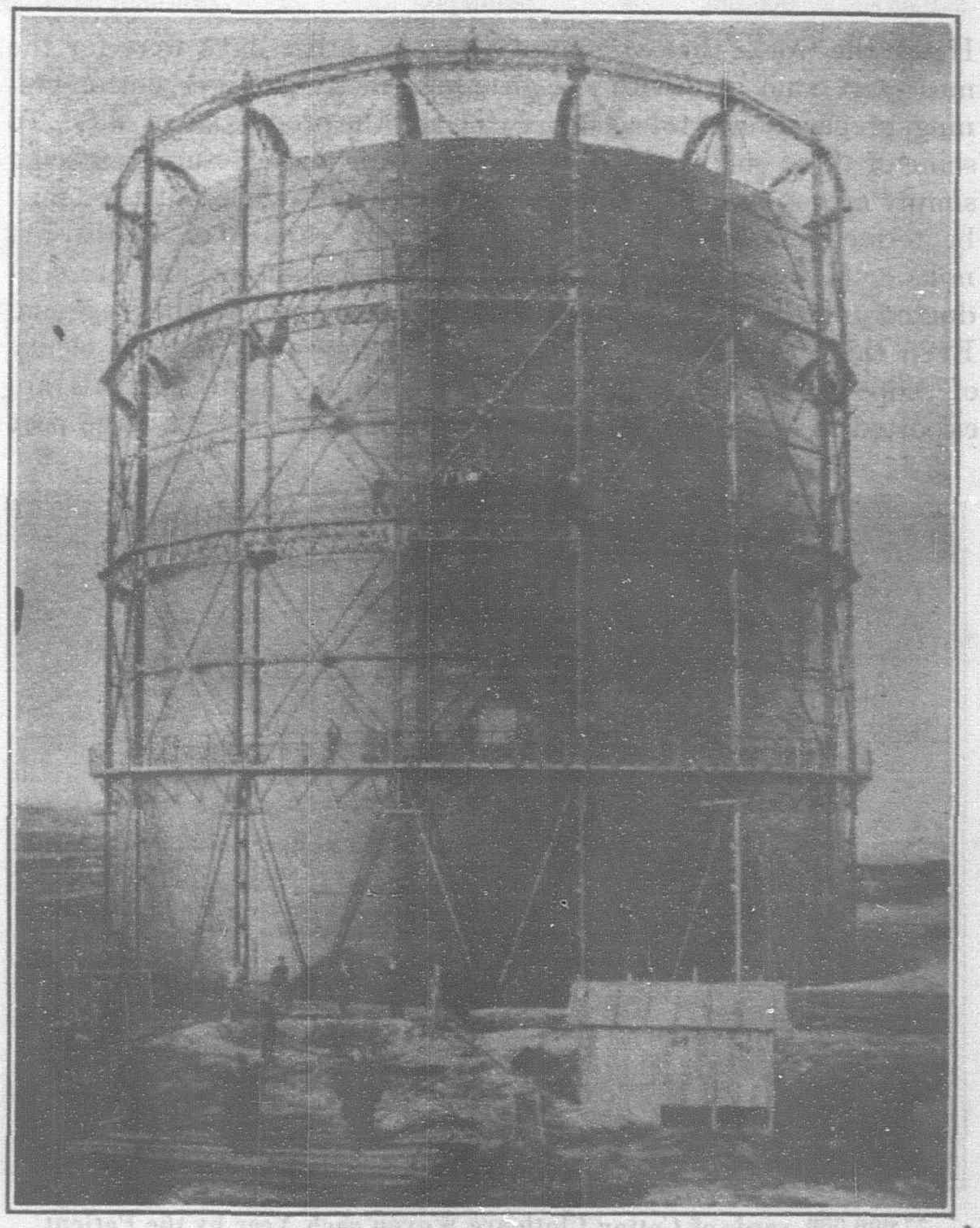
As the cost of coal decreases gas companies naturally must decrease their charges. But if the cost of coal rises, then their incomes will decrease, and they will be obliged to raise their charge again. If present contracts with the municipalities are not subject to cost changes with the rises and falls in the price of coal, the gas companies will probably find themselves hard hit at some not distant time, if the wishes of the coal companies can be realized.

From one point of view Japan's gas industry seems to have reached its topmost height. Of course, hereafter demand will increase, and supply will also increase, but the rate of increase will not be very great nor very fast. Sooner or later the extension of the electric light companies, and power companies will react on the gas companies and their profits will fall. Then there will come a shifting of capital to electric enterprises now actually going on.

Automotive Development

The Tsing Pei or Northern Shansi Automobile Transportation Company is being organized at Taiyuanfu with a capital of $20,000.

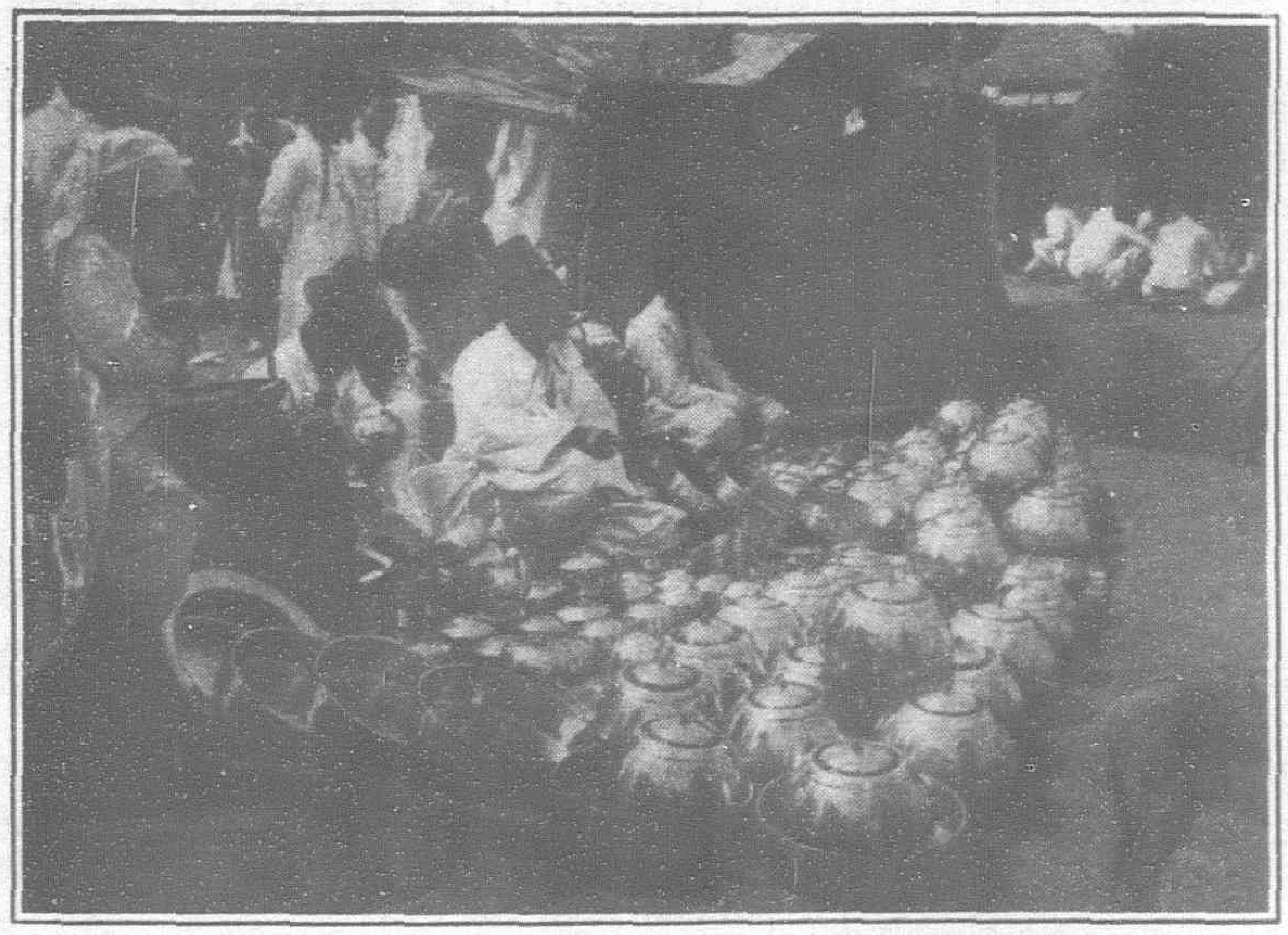
Mr. Wang Chi-liang is promoting an automobile transportation company at Hankow to operate a service on the outskirts of the city.


Gas Tank of the Nagoya Gas Co.

Korean Industries

By T. Hoshino

KOREAN industries are mostly of a very crude nature, some being hardly worthy of the name, requiring neither a large capital nor great technical skill. This state of affairs will continue for a considerable time yet, seeing that the articles requiring either or both of these for their manufacture can be imported from Japan with advantage, unless there are special reasons in favor of their being made here. Hence the works that came into being in earlier days were for the most part connected with rice-cleaning, smelting of ores, cotton ginning, preparation of tobacco, brewing and the production of salt. To some of these one would grudge the name of manufactures, as being simply a process in the preparation of raw materials, but they may be termed manufactures in that they are carried on in distinct mills or factories, by persons who are not producers, and are conducted more or less on the lines of the modern factory system. Even these rough kinds of manufacture, however, present plenty of scope for development, since, for example, most minerals are exported in the form of ores whereas, if smelted here, a large part of their freight could profitably be saved. In short, the manufacturing industry of Chosen is only just out of its primitive stage, and we must look to the future for its great development.



Korean Brasswork is Famous for its Excellence

The Korean Chest is Prized as a Work of Art and Utility

Growth of Factory System.—As in the case of most new countries, of which Chosen is one when speaking economically, a feature in the economic progress of the peninsula is the passing over of many of the intermediate stages through which one system has developed into another in older countries. Rapid as the progress of Japan has been, it has not been half so sudden as in the case of Chosen. For instance, in the silk industry, many stages were passed through in Japan before it reached the present factory system. The domestic system was long in vogue there, during which many homes were provided with hand-reeling machines, and the cocoons they produced were made into silk before appearing on the market, or else the cocoons to be reeled were given out by entrepreneurs to their employees who did the work in their own homes. But in Chosen, all such intermediate stages have been skipped over. It is but a few years ago since cocoons began to figure in the list of

77,000,000 yards of Cotton Cloth are Woven each Year by the Patient Women of Korea

A Korean Pottery Market

The Toa Tobacco and Cigarette Factory at Seoul, now Operated by the Government Monopoly Bureau

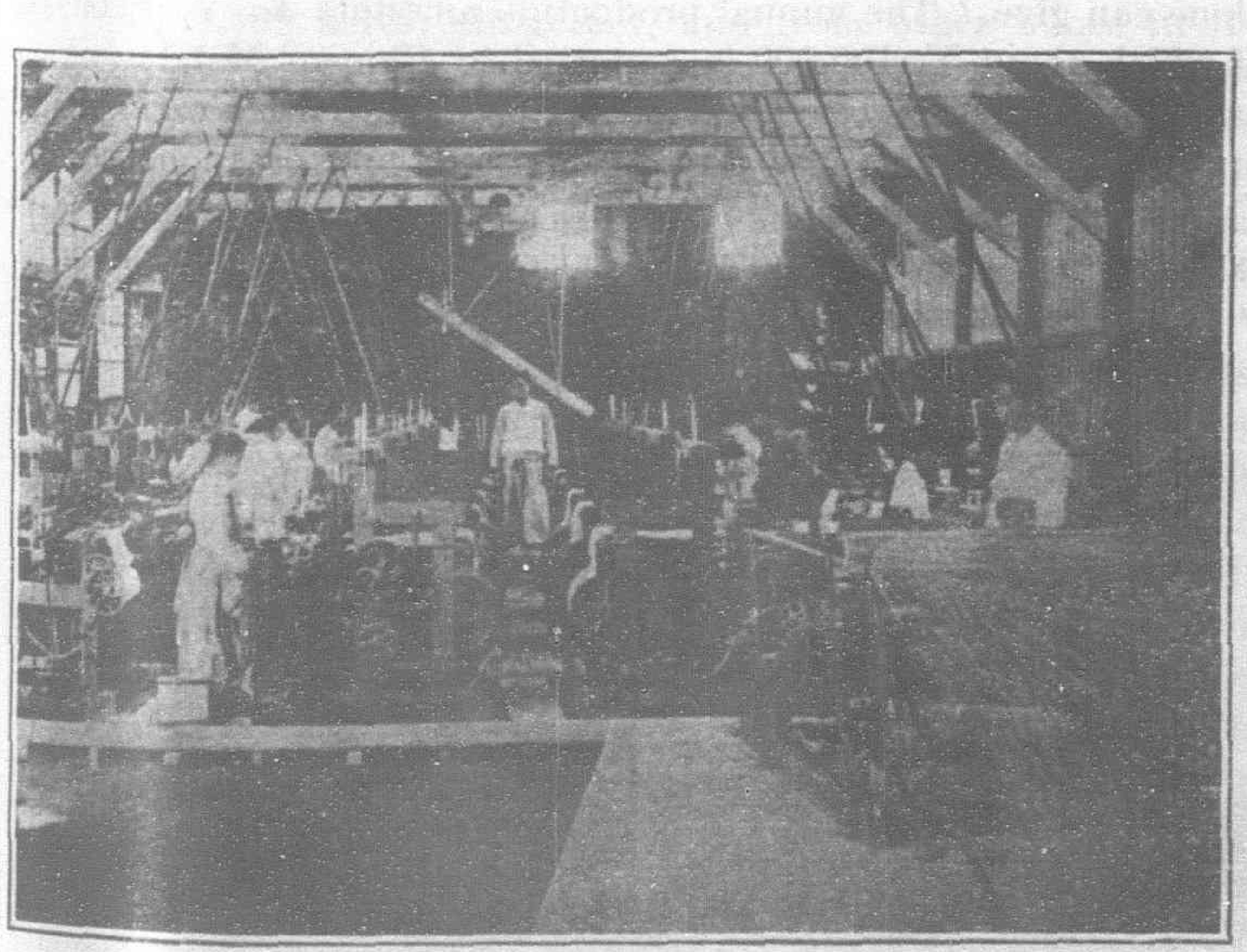
exports, and already we have here silk factories as well equipped as any in Japan, though on a very small scale. Thus many processes for preparing raw materials which are performed in individual homes in Japan are done in Chosen in factories, with the result that factories have increased very rapidly in recent years, as shown in the following table:—

Year	Number of Factories	Capital	Motive Power		Value of Products
			Number of Engines	Horse Power	
		Yen			Yen
1911	252	10,613,830	148	6,058	19,639,655
1912	328	13,121,481	205	8,069	29.362,307
1913	532	17,478,146	319	9,908	36,066,172
1914	654	17,371,832	319	13,278	32,754,797
1915	782	21,113,607	405	16,252	45.931,133
1916	1,075	24,613,500	459	17,460	59,026,639
1917	1,358	39,038,966	619	26,170	98,972,187
1918	1,700	48,309,485	714	26,151	156,801,630

Thus it is seen that during the past seven years the number of factories has increased by more than 575 per cent., capital by about 355 per cent., and the value of production by 698 per cent.

Korean Manufactures Classified.—The following table gives the various kinds of manufactures, the number of factories for each, the amount of capital invested, and their production according to the statistics for 1917, also the nationalities of those engaged in their manufacture:—

	Nationality of Owners	No. of Factories	Capital	Value of Products
			Yen	Yen
Dyeing and Weaving	Japanese ...	15	99,750	117,579
	Koreans ...	68	221,390	511,975
	Total ...	83	321,140	629,514
Spinning	Japanese ...	2	43,000	40,125
Cotton ginning	Japanese ...	19	6,752,239	6,073,075
	Koreans ...	2	15,000	100,098
	Total ...	21	6,767,239	6,143,173
Pulp	Japanese ...	1	?	129,600
Paper	Japanese ...	3	15,000	14,516
	Koreans ...	51	15,886	58,022
	Total ...	54	30,886	72,538
Tanning	Japanese ...	8	1,991,036	3,531,663
	Koreans ...	37	52,900	229,193
	Total ...	45	2,043,936	3,760,802
Ceramics...	Japanese ...	67	506,500	631,944
	Koreans ...	115	137,720	169,350
	Total ...	182	644,220	801,294
Soap	Japanese ...	10	117,700	169,178
Candles	Japanese ...	4	29,500	301,000
Matches	Japanese ...	1	7,000	30,000
Dye-stuffs	Japanese ...	1	40,000	98,437
Artificial manures	Japanese ...	4	280,000	165,012
Metal ware	Japanese ...	57	279,270	1,590,729
	Koreans ...	106	202,250	378,695
	Total ...	163	481,520	1,969,424
Carpentery	Japanese ...	14	81,510	102,636
	Koreans ...	19	32,867	76,656
	Total ...	33	114,377	179,292
Lumber	Japanese ...	16	396,000	1,130,195
Shipbuilding	Japanese ...	8	54,500	90,779
Rice-cleaning	Japanese ...	143	3,549,766	41,517,861
	Koreans ...	154	546,420	5,855,153
	Total ...	297	4,096,186	47,373,014
Flour milling	Japanese ...	9	133,140	168,062
	Chinese ...	1	500	4,500
	Total ...	10	133,640	172,562



Matting Factory, Seoul

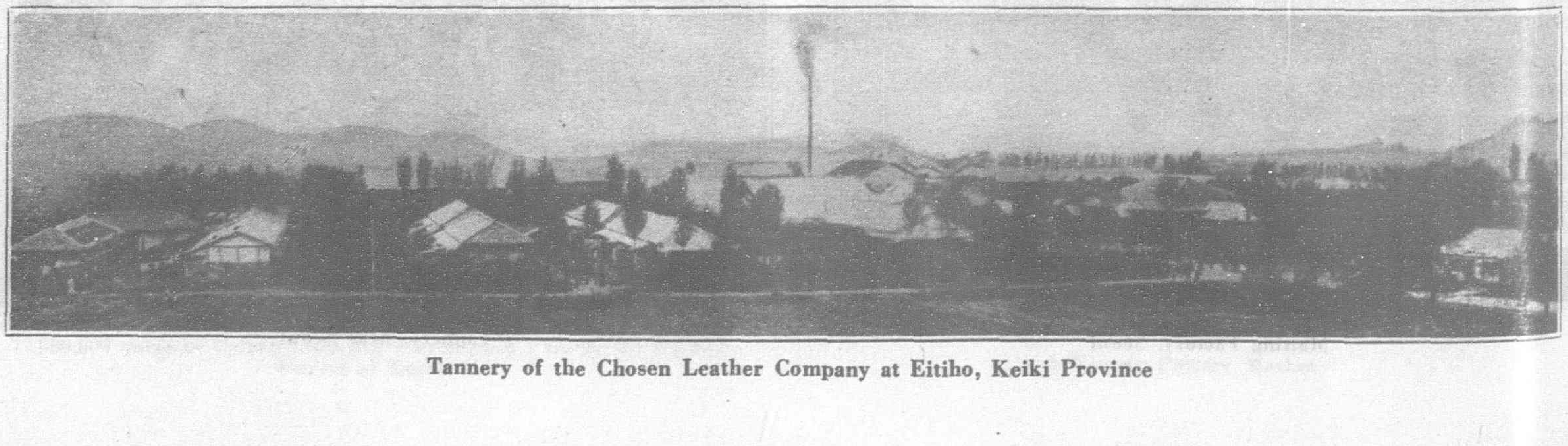
Tannery, near Seoul

Government Saw Mill and Lumber Yard, Shin-gishu

	Nationality of Owners	No. of Factories	Capital	Value of Products
			Yen	Yen
Tobacco	Japanese ...	21	2,214,413	6,016,332
	Koreans ...	5	211,880	539,627
	Total ...	26	2,426,293	6,555,959
Brewing	Japanese ...	108	1,968,485	1,835,318
	Koreans ...	6	101,000	97,216
	Chinese ...	3	23,000	53,363
	Total ...	117	2,092,485	1,985,897
Salt	Japanese ...	15	398,150	676,773
Canning	Japanese ...	23	301,631	450,543
Printing	Japanese ...	59	617,965	1,400,014
	Koreans ...	11	103,110	65,540
	Total ...	70	721,075	1,465,560
Tailoring	Japanese ...	12	91,050	341,950
	Koreans ...	22	214,150	248,528
	Total ...	34	305,200	590,478
Smelting of ores	Japanese ...	26	8,832,555	14,801,381
	Koreans ...	2	15,000	10,330
	Foreigners	7	2,207,582	5,975,230
	Total ...	35	11,055,137	20,786,941
Gas and electricity	Japanese ...	17	4,402,548	2,176,297
	Jap. & Kor.	3	384,733	134,769
	Foreigners	1	850,000	14,442
	Total ...	21	5,637,281	2,325,508
Others	Japanese ...	73	457,650	800,626
	Koreans ...	7	13,220	23,418
	Jap. & Kor.	1	25,000	22,000
	Chinese ...	1	5,000	2,545
	Total ...	82	500,870	848,589
Total	Japanese ...	736	33,660,358	84,401,585
	Koreans ...	605	1,882,793	8,363,753
	Jap. & Kor.	4	409,733	156,769
	Chinese ...	5	28,500	60,408
	Foreigners	8	3,057,582	5,989,672
	Total ...	1,358	39,038,966	98,972,187

It will be seen from the above table that, in the amount of capital invested, the smelting of ores occupies the foremost place with Y. 11,055,137, and is followed by cotton ginning with Y. 6,767,239, and by gas and electricity, rice-cleaning, tobacco manufacturing, brewing and tanning in order, while as regards nationalities Japanese play by far the most important part, providing 86 per cent. of the capital and turning out 85 per cent. of the total value of production. The inactivity of the natives in the manufacturing field is regrettable, but they, too, are awakening, and it will not be long before they figure very largely in this new phase of economic activity.

Native Industries.—Of the native industries, in which the Koreans made considerable progress at one time, what now remain are weaving, ceramics, paper-making, brewing, metal working and a few others. The weaving of cotton is mostly carried on by the country women at home, yet its production during 1917 is estimated to have reached 3,400,000 pieces (76,613,000 yards). Recently small factories have sprung up for the carrying on of this work on a larger scale. Silk weaving is also carried on in some localities, but its annual production hardly exceeds 210,000 pieces (4,732,000 yards). Hemp-weaving is only next in importance to that of cotton, and its annual production is considered to be about 2,600,000 pieces. The statistics for 1916 show that the total production of cotton tissue in that year amounted to Y. 3,630,000 in value, that of hemp cloth to Y. 3,670,000, that of silk to Y. 740,000 and that of mixed tissue to Y. 60,000. The art of ceramics in which the Koreans once exhibited great skill has long died out. But the revival of this lost art seems dawning, as is shown by the fact that some Koreans have already established factories on a fairly large scale for this purpose, of which the most noted is the Pyengyang Porcelain Factory. The report for 1916 puts the total production of earthenwares, porcelain and unglazed pottery in that year at Y. 850,000, glass wares at Y. 70,000, earthen pipes and bricks Y. 640,000 and lime at Y. 60,000. The manufacture of native paper has survived modern mills, the Korean paper having a peculiarity of its own which the primitive method they employ alone can give. The annual production amounts to Y. 1,500,000 of which about Y. 100,000 is exported to China. Metal working has been extensively conducted in Korea since very early times, brass utensils being very largely used in the Korean household. They still exhibit considerable skill in this art. Brewing is also extensively carried on and the total quantity of liquors produced is estimated at about 40,000,000 gallons. Among other native



Tannery of the Chosen Leather Company at Eitiho, Keiki Province industries, the manufacture of *wangol* goods is very promising, the *wangol* being a kind of reed peculiar to Chosen, growing in marshy places, with which the farmers made matting from early times. Of late, various articles, baskets, hats and fancy goods, are being made of it, and in 1916 the total production amounted to Y. 490,000 in value. On the whole, it may be said that the native arts and industries are being fostered with the utmost care and have made some progress. But the real progress is seen in the new type of manufacture introduced by the Japanese and conducted on the factory system of which a brief description is given below.

New Industries.—A feature of the new industry is, as we have observed before, its being conducted according to the factory system, and that its products are intended rather for export than for home consumption. The great majority of the Korean people, considerably advanced as they are in their standard of living as compared with some years ago, need but few things besides what they make by their own hands, and the Japanese and foreigners in the land are yet too few to need to retain much for their own use. The result is that a great part of what is produced by the new industry, as we call it, is exported abroad. There are, of course, some exceptions, the notable one being tobacco, the greater part of which article is consumed in the country. Yet, even in this case, the export of cigarettes to China is increasing yearly. Another feature is that it is almost exclusively undertaken by Japanese. A glance at the foregoing table of Korean manufactures classified will convince the reader of this fact. This is but natural, seeing that the Japanese are the richer and more enterprising of the two predominating populations of the country, and especially in view of the fact that the destination of the articles manufactured is mostly Japan.

The more important of these new industries are listed in the same table quoted above, the principal ones being smelting of ores, cotton ginning, gas and electricity, rice-cleaning, tobacco manufacture, brewing, tanning, salt manufacture, etc. There are still others which do not appear in the list at all, or, if they do appear, the figures relative thereto are very insignificant, and yet they are of paramount importance on account of the great future they are considered to have in store. These are the manufacture of flour, sugar, pulp, cement, porcelain and matches, and spinning.

Below we give a general survey of the manufacturing enterprises in the peninsula.

Iron works on an extensive scale have just been founded in the Peninsula by the Mitsubishi firm at Kyumipo in Whanghai province. When completed it is estimated the foundry will produce 100,000 tons of pig iron, 62,000 tons of ingot iron and 73,000 tons of iron plates, bars, etc., together with a large amount of by-products. The supply of ores to the foundry is to be drawn from the company's own mines, six in number and covering an area of 10,000,000 *tsubo* (8,169 acres) altogether, and from other mines in the neighborhood. These and other works in this line are considered to be highly promising on account of the plentiful supply of materials. The manufacture of pulp was begun some six years ago by a Japanese who made use of reeds as material, but it is only recently that public attention has been called to this important industry by the establishment of a large joint-stock company in Shinwiju with a capital of Y. 5,000,000. The famous Yalu timber will be made use of as material, and when the factory is in working order it is expected to turn out about 30 tons of pulp daily, or about 10,000 tons a year. The growth in the manufacture of pulp will, it is considered, further encourage the manufacture of paper, for which the country has been famous from of old. Tanning is considered one of the most hopeful industries in Chosen on account of the presence of hides of excellent quality in large numbers. One large tanning company was established in 1911 at Yung-dung-po with a capital of Y. 1,000,000, and this has since been engaged in the making of leather belting, sole-leather, harness leather, box calf, etc., by the process of oak and chrome tanning. The company received large orders for military boots and cartridge pouches from the Russian government during the European war, which at one time amounted to quite considerable figures. Cotton spinning and silk manufacture have also a good prospect because of the increase in cotton growing and in sericulture. Great hope is also entertained as to the future of the tobacco industry since the annual consumption of tobacco in the peninsula amounts to Y. 6,000,000. The largest tobacco factory is the Toa Tobacco Factory in Seoul with branch factories in Pyengyang and Chunju. The output of this company has not only succeeded in ousting the imported cigarettes from Japan and Shanghai, which until quite recently monopolized the Korean markets, but is exported in goodly amounts to Manchuria. The manufacture of sugar is also considered very hopeful. Experiments have shown that the sugar-beet grows excellently in Chosen, and an attempt at the establishment of a sugar factory was made in 1912, which, however, failed to be carried through. Recently a large sugar factory has been established in Pyengyang with a capital of Y. 5,000,000 by Japanese and Koreans jointly. If it succeeds, Chosen will have another important branch added to her industry. Enterprises of various other kinds, notably in chemicals, are being contemplated, some are under promotion, and some are already organized. Such are the manufacture of soda, for which the cheap Korean salt obtained by the process of spontaneous evaporation is available as material, the manufacture of oils and fats for which the country furnishes plenty of material in the form of fish and vegetable oils, of pottery by making use of the abundant kaolinite found in the peninsula, and of glass, in the making of which the native siliceous sand is to be used.

Government Enterprises.—The government of Chosen conducts several industrial enterprises such as the manufacture of briquets by the Pyengyang coal mining station, the saw mill attached to the lumber station in Shinwiju printing at the printing bureau in Yongsan and the manufacture of salt by the salt-manufacturing station at Kwangyangman and Choоan. Of these, the first two items have already been touched upon in the preceding chapter under the headings of mining and forestry respectively. Printing, the third, is too trivial in character to be dealt with at any length in such a work as this. Suffice it to say that, besides the government documents largely printed by the bureau, the Bank of Chosen notes, circulating at this time to the amount of over Y. 150,000,000 in Chosen and Manchuria, are also printed by it. The fourth, that is the manufacture of salt, needs some description because of its being one of the principal items of the manufacturing industry of Chosen.

The government salt-pans for natural evaporation at Kwangyangman and Chooan covering in all 2,526 acres, were completed in 1913 and have ever since been supplying the peninsula with this much needed commodity. The following table gives the area of the basins, their yield, and the receipts during the last nine years:—

Year	Area of Salt Basins Acres	Quantity Produced Pounds	Quantity Sold Pounds	Value Yen
1910	219	1,317,804	1,357,758	4,606
1911	1,415	5,966,390	3,477,249	18,382
1912	2,334	19,818,118	14,977,687	73,758
1913	2,526	56,201,622	20,783,937	63,104
1914	2,526	64,457,793	48,222,928	104,171
1915	2,526	68,581,186	69,679,614	222,868
1916	2,526	94,414,550	58,678,008	197,706
1917	2,528	117,182,683	?	?
1918	2,528	102,396,141	?	?

It is to be noted that, in spite of the progress made by the government salt-pans, they are hardly yet in a position to supply even half the demand for salt in the peninsula, which demand is rapidly growing, making it necessary to import a great amount of foreign salt. The total amount of imported salt in the fiscal year 1918 reached over 376,425,000 pounds, valued at Y. 1,502,000, which shows an increase of 84,092,478 pounds, valued at about Y. 500,000, over the preceding year. Among the different kinds of imported salt, Chinese evaporated salt coming from Shantung led the rest in 1918, amounting to 328,367,552 pounds in quantity.

Modern Progress in the Province of Fukien

By Rev. J. E. Walker

WHEN the empress-dowager inaugurated her plans for a general system of modern education, Foochow city responded promptly, as did in greater or less degree all other cities on the Min River. Buildings for the various schools were erected or remodeled in Western style on a liberal scale, and schools of the several grades were opened. Various influences had prepared the way for this; and not the least were the three mission "colleges" at Foochow. A start in teaching of English and Western sciences had been made by the Anglo-Chinese College as far back as 1881. This was located in Nantai, the foreign settlement, three miles south of Foochow city. Not long after a mission school in the city also took on these branches, though on a smaller scale; and the two reached a larger constituency than would the more distant one alone have done. St. Mark's College, though the third one to take up these branches is now doing so on a large scale. The three have drawn in students from the whole province, especially the northern and central parts. Quite a number of graduates from these schools have pursued further studies abroad, and are now filling various positions at home as professors, doctors and in official positions. Two years ago two Americans were at a little feast given by returned students. Dainty Chinese courses in elegant Chinese dishes were partaken of with chop-sticks; but the lively conversation was carried on in faultless, fluent English.

At the present time the province is divided between north and south along the line of the Min River. Foochow, and everything north of this river is under the north, and everything south is under the southern government. This hinders progress very much.

Among other enterprises was a modern hospital well housed in a two story brick building, and fairly well equipped. Dr. Margaret Ling was put in charge of it. She was the daughter of a former Foochow pastor, had graduated from the Foochow College, and then had gone to America where in due time she graduated from Chicago Medical School which is connected with the Illinois State University, and was well qualified for the position. But mismanagement of funds wrecked the institution; and it was closed about a year and a half ago. An offending manager committed suicide.

One remarkable advance at Foochow has been the opening of the horse road from the end of the Long Bridge (Wan-shou Ch'iao) to the city, and on into the heart of the city. This shows how thoroughly the old bondage to "*Feng Shuei*" is broken. The South Gate was the dragon's mouth, and the white pagoda on the east and the black pagoda on the west were the dragon's horns. The ground in and about the South Gate was so low that in case of a flood in the river it would be overflowed to a depth of one to five or even to ten feet.

The horse road was begun in the fourth year of the republic and was finished in the seventh. It first turned east from the head of the Long Bridge till it reached the outside of the suburbs, then pursued a general northerly course for about two miles, then turned west till it reached the Water Gate by which it entered the city.

From this point it was extended into various parts of the city. It was finished in the seventh year of the republic, was soon well supplied with jinrikshas, and much patronized by the well-to-do. But all foot travel between the city, the south suburbs and the foreign community went by the shorter South Street; and then this also was opened to the horse road. A gap was made right through the city wall on the east side of the South Gate, the low ground in and about which was filled up till the gate was closed to all travel. The shops facing on the street retracted their fronts to make a street wide enough for three autos to go abreast; and now horse carriages and autobusses dash along the once sacred South Street. The jinrikshas also run out through the West Gate up to the Upper Bridge (Yun-shan-ch'iao); and in time they will be running down the river to the anchorage.

There is talk of a highway to extend clear across the province to the head waters of the Min, and then from there over the divide into the Kiangsi province. This will come when the country is united again under one good government. The influence of the waterworks, electric lighting and widened streets is felt all through the Min valley; and beginnings along these lines have appeared at various points in the interior. The whole province is rich in water power, now all running to waste. But the old superstitions are breaking down; and the people are ready. All now waits on capital; and capital waits for confidence in an established government acceptable to the people.

Min River conservancy is an enterprise which aims to provide a thirteen-foot channel from the anchorage to the bund of the foreign settlement on Nantai Island, distance of nine or ten miles. Work was begun nearly three years ago and much has been accomplished. A large capital was borrowed to begin with, and a large yearly income provided for through a surtax on shipping and goods from both the maritime and native customs. For the second year ending February 28, 1921, the sum derived from these sources was $110,659.30. According to the report issued for the second year by the conservancy executive committee, it began with $688,436.58 and closed with $674,336.51 balance on hand.

New shore is built up by means of bamboo and broken stone dykes; and in the course of a year or two the banks attain a sufficient height to warrant their being faced with broken stone, and thus rendered permanent. The stone is taken from a quarry conveniently located on Kushan Point about midway between the two termini. A flood of unusual violence beginning June 26, 1920, severely tested the strength of the work as so far carried on, with but little damage resulting. Foochow's supply of bamboos comes mainly from a region on the Yung-fuh river; and banditi at times hinder the prompt and full supply of bamboos. The conservancy commission had purchased the site of the quarry as government property; but as soon as they began work, several parties from a near-by village claimed ownership of part of the site, but were content with contracts for quarrying the stone from their own sites at the same prices as the original contractor. At the start river boats and boatmen were hired to deliver the broken stone; but they made so much hinderance with strikes, etc., that the commission had ten pontoons built; and now for the past year the work has been going steadily forward with increasing rapidity.

The executive committee consists of Mr. Ling Ping-chang, Chinese delegate; Mr. G. C. Hanson, American consul, representative of the consular body; Mr. Percy R. Walsham, commissioner of customs, honorary secretary and treasurer; Mr. H. von Heidenstam, royal Swedish corp of engineers, consulting engineer; Mr. J. R. West, M. AM. SEC. C.E.E., engineer-in-chief. The secretariat and official staff consists of Mr. S. T. Polk, assistant secretary, and four Chinese; and there is a technical staff, consisting of Mr. J. G. Grant, superintendent of works, and fourteen Chinese, surveyor, draftsmen, cadet engineers, overseers, etc.

The government has opened a number of trade schools; also two schools of agriculture, one for young men and one for young women. There are also primary, higher primary and middle schools with a large enrolment of students: also a commercial school, a mining school, a foreign language college, a normal school, boys and one for girls; also here and there kindergarten schools. But it is with great difficulty that the schools are kept going for lack of money. A union college of the three missions has a little over 100 students.

At Amoy Mr. Tan Kak-hee has given millions for the founding of an university; and Mr. Lim Boon-king of Singapore has been elected president.

The most important thing, and one that does not appear on the surface is the changed attitude of the Foochow gentry toward everything Western. There is this "the promise and potency" of yet greater things to come.

Commission Government in Canton

By Orrin Keith

THE cities of China have from time immemorial been administered by the authorities of the province in which they were situated. They were merely a part of the province. Such a thing as a municipality was unknown. The governing of a huge city, like the administration of justice or the command of an army, was considered to be entirely within the competence of the classically educated mandarin.

Students of political science returning from America brought the information that in that country city administration was considered a highly specialized study; that men devoted as much time and labor to the understanding of the problems of municipal administration alone as the scholars of old gave to their whole series of degrees. City problems were not a mere phase of provincial organization. They required separate treatment and separate organs of administration. In short, city government was in a sphere of its own and should be removed entirely from the control of the provincial authorities.

This line of reasoning, however, had no attraction for the members of the mandarinate. The provincial governors realized full well that the largest share of their revenues came from the large cities in their provinces. They were not minded to give up these revenues to humor the whims of Western knowledge and to furnish material upon which returned students might try experiments with results which no one could foresee. If the ordinary mandarins refused to sacrifice cash returns for the advancement of political science in China, it was hardly to be expected that the anamolous individuals known as tuchuns would be more favorable inclined. Not for a moment! Cities existed to furnish money, not to be well governed.

General Chen Chiung-ming, Governor of Canton.

In the South, however, was found a tuchun of another mould. As soon as General Chen Chiung-ming had succeeded in driving out of Canton the defeated armies of the Kwangsi militarist party and had re-established parliamentary government in Kwangtung, he gave ear to the suggestions of a young man who had devoted his years of study in America to the science of municipal government. This young man was Sun Fo, son of Sun Yat-sen. He had pursued his studies first at the University of California and then at Columbia. He was filled with the desire to see his city of Canton placed under a modern administration and he pled with the governor to grant the city a charter.

The governor complied with his wish and Sun Fo and several of his associates set to work upon the draft of a charter. There were many problems to be dealt with which had never come up in connection with American cities so that some originality was demanded. The new charter could not be a mere copy of selected provisions from American documents. It was soon completed, however, and presented to the governor for his action. On December 23, 1920, Governor Chen promulgated the provisional charter of the city of Canton, the first municipal charter in China.

The document is an admirable example of brevity in state papers. It fills but eight printed pages and its logical order and clear definition are equally commendable. It is a tribute to the training of its author. In another point it is a departure from the precedent of Oriental constitutions. The ultimate control being frankly retained in the hands of the civil governor, there is no attempt to hide or disguise the fact. The people of Canton have had no experience in electing officials nor in administering their own affairs and the provisional charter gives them an opportunity to take over these responsibilities gradually.

The first unusual problem which presented itself was to determine what was the city of Canton. The old system required no line of demarkation between the city and the surrounding country so the city had no recognized boundaries. The first chapter of the charter therefore provides for a city boundary Commission which shall define and fix the area and boundaries of the city. This commission is appointed by the civil governor so that there will be no undue encroachment on the province. After the boundaries are fixed, the city may extend its area with the consent of the civil governor but no territory once included within the city can be separated and establish itself as a separate municidality. The area thus determined is declared a loacl government directly under the provincial government and independent of the hsien administrations.

Wu Ting-fang, the veteran diplomat, now directing the Foreign Affairs of the Canton Government.

The sphere of municipal activities is a large one and includes practically everything which pertains to city government in America. Finance, highways, sewers, public health and amusement, public safety and fire prevention, education charity, communication, transportation, water, gas, and light, city properties, a city census, are especially listed as among the functions of the new government. In addition other matters and affairs may be assigned to it by the central and provincial governments.

The powers of the new government are exercised by a commission of seven known as the municipal executive council. This council consists of the mayor and the commissioners of the six established departments: Finance, public works, public safety, public health, public utilities, and education. The council governs its own proceedings, and its action upon any question within its jurisdiction is apparently final, even the civil governor being powerless to interfere.

It is the intention ultimately to have the mayor elected by the people of the city. For the first term of five years, however, and until the people have some experience in electing civic officials as provided elsewhere in the charter, the mayor is appointed by the civil governor. Quite appropriately General Chen conferred this appointment upon Sun Fo, not because he was the son of President Sun, but because he was the man obviously qualified to fill the position.

The commissioners are appointed by the civil governor upon the recommendation of the mayor. The first commission is composed entirely of returned students who have made municipal administration their specialty in the universities of other countries. Three, beside the mayor, are from America, two are from Japan, and one from France.

The department of finance has charge both of the assessing and the levying of taxes, the control of city properties, the management of municipal loans, and the general collection and payment of city funds. There are at present no loans in existence though one, a large one, is contemplated in connection with the plans for the extensive development of Canton as a sea-port and the building of miles of wharf for ocean-going vessels.

The public works department has charge of the laying out of new city streets and the widening of old, a work in which Canton is busily engaged at the present time. It directs the construction and repairing of streets, bridges, sewers and conduits. Of the latter there are none as yet, but their construction is a necessity before Canton can become in any real sense a modern city. The regulation of building and the supervision of parks and public buildings are also functions of this department. Building regulation is of greatest importance in burned over areas, as the city insists that these areas shall be rebuilt, not as they were, but in accord with the demands of modern efficiency and sanitation. This means streets as differentiated from narrow alleys and requires endless diplomatic negotiation with heads of families whose personal interest for the moment renders them none too sympathetic toward the new order of things.

The department of public safety controls the police, of whom there are about 4,000, and the fire brigade, of which there are about 100 members! Order is fairly well preserved in Canton and even traffic is much better regulated than in most Chinese cities. The officers direct the traffic instead of being directed by it as in Peking. Fire protection, however, is entirely inadequate. The neagre city fire force is supplemented to some extent by the efforte of volunteer guild and hong companies but the frequent conflagrations are sufficient evidence that this is one of the functions of the municipality which will require early attention. The fires are not only frequent but disastrous. Acres of buildings go down almost every time. It has one compensation. It hastens the widening of the streets and the modernization of the city. But pursued for this end alone, the method is a drastic one. The department of public safety is also authorized to organize a "Citizen's Volunteer Corps," but just what is intended here is not so clear. No attempt has been made in this line as yet. The department is also charged with the suppression of illegal and disorderly businesses.

The department of public health is expected to attend to the cleaning of the streets—no small undertaking in the unrenovated portions of the city. It regulated the markets, slaughter-houses, baths, restaurants, saloons, theaters, and public latrines. It registers births, deaths, and marriages and has charge of the city census, a matter which cannot progress very far, at least in securing the total number of the population, until the boundaries of the city are fixed. Medical practitioners, dryg stores, and hospitals come within its jurisdiction. A foreign diploma is sufficient to permit the holder to practise the healing art. Also those native practitioners who are over 40 years of age and have practiced for ten years are permitted to continue. All others, however, must take an examination based upon a required course of study. As both the course and the examination are determined by a board of the old practitioners, it may be assumed that the number of native practitioners, now about 1,500, will not increase with undue acceleration.

The department of public utilities is charged with the management and regulation of tramways, gas, electricity, and telephone service. Its jurisdiction extends to the regulation of motor-cars, rickshaws, sedan-chair, ferry-boats, etc. Rickshaws in Canton are all owned by large companies. Ten of these companies are operating at present. Each rickshaw is taxed by the city $100 a year. The companies pay this tax and rent the rickshaw to the coolies who in turn must pay a rental of $16.50 a month, or nearly 55 cents a day. One coolie usually works during the day and then sublets the rickshaw to another for the night at 25 or 30 cents. Private motor-cars pay $80 a year and public or rental cars, $100 to $120 according to size.

The department of education includes beside the control of the city schools, the supervision of private schools, the regulation of theatres and other public places of amusement, the promotion and supervision of private charities, and a measure of responsibility for the maintenance of a poor house, a blind school and a leper hospital which are under the immediate management of the Catholic mission. One-fifth of the municipal budget has been appropriated for purposes of education. This amounts, however, to but little over half a million dollars or about two dollars per year for each child of school age. Its significance lies in the fact that it is larger than the amount spent in the entire province until the present *régime*. The municipality maintains 61 schools. There are 41 primary schools, 17 higher primary schools, one commercial school, one agricultural school, and one nurses' training school. The total number of students in the municipal schools is about 7,000, of whom 2,000 are girls. The private schools, however, carry the bulk of the load. There are about 1,000 of these and the attendance is as high as 33,000.

In addition to the regular departments, there is a secretariat of general affairs which is charged with the care of official correspondence and files, the editing of the *Municipal Gazette*, a weekly publication, recording of documents and all matters not assigned to other departments. This work is directly under the supervision of the mayor.

The salaries of the higher officials are fixed by the charter. The mayor receives $500 a month, and each of the commissioners $400. The compensation of all other officers and employees is decided by the municipal executive council.

The most interesting feature of the provisional charter is the provision for a municipal advisory council, which is designed to represent the people of the city as an advisory body to the municipal executive council. It is here that the training of the people in citizenship comes in. The advisory council is composed of thirty members who are divided into three categories. Ten members are appointed for the first year, ten are elected by the people of the city, and ten are chosen by different economic interests as follows: three by the merchant class as represented in the general chamber of commerce, three by the labor class as represented in the labor organizations, one by the teaching profession as represented in the educational association, one by the legal profession as represented in the bar association, one by the medical profession as represented by the medical association, and one by the engineering profession as represented in the engineering association. Elections are to be held annually and each year the number of members elected by the people shall be increased by two and the number appointed by the governor decreased by two. The provision for the representation of economic interests as such is a new departure which may or may not owe its introduction to the dissemination of Soviet doctrines over the world. It is not, however, the result of local Bolshevism, which apparently does not exist. The municipal advisory council was to have been organized within three months after the promulgation of the charter, but the good citizens of Canton were too apt pupils in the art of municipal elections. The first election was held and immediately contested on the ground of bribery and illegality. After a lengthy trial in the courts, the entire election was declared void and a new one ordered. This has just been completed, apparently with better success, but the council still awaits the appointment of the gubernatorial nominees before it can organize. The powers of the advisory council extend to the submission to the executive council of petitions presented by the citizens, the decision of matters submitted by the executive council, and the examination of the condition of the different departments. In case of disagreement on submitted matters, the final decision rests with the civil governor. The advisory council thus becomes sort of a permanent grand jury with a right to examine and report upon the conduct of the municipal government and each of its departments. The members of the Council receive $500 per year for their services.

The qualifications for municipal electors are as follows: Age of 21 years, domicile in the city of Canton for one year, legitimate occupation, ability to read the charter, good and sound mind, and full possession of civil rights. Elections are held one month before the expiration of the term of the acting members of the council and are supervised by an election commission of five appointed by the civil governor.

As in most governments to-day, the chief problem of the new municipality is that of finance. The sources and amounts of revenue expected by the city are given in the municipal budget as follows:

House rent tax (10 per cent. of annual rent, one-half by each party)	$645,045.00
Sing-song girl license	518,000.00
Theatre licenses	77,700.00
Cinema licenses	12,420.00
Boat licenses	28,956.00
Rubbish disposal	7,200.00
Rickshaw licenses	291,458.00
Market stall rentals	3,583.00
Rent from Taishatou Island	2,170.00
Public lands converted	63,520.00
Provincial government subsidies	240,000.00
Physicians registration fees	5,000.00
Special business registrations..	1,270.00
Building permits	3,600.00
Blind singers licenses	1,500.00
Novelties license	500.00
Fines	15,180.00
Confiscations	414.00
Fines from Department of Public Works ..	960.00
Municipal Gazette	800.00
Municipal Hospital	1,200.00
Recording of title-deeds, etc...	49,000.00
Total	$1,969,997.00

The expenses of the government are tabulated as follows:—

Mayor's Office	$51,192.00
Department of Finance	63,652.00
Department of Public Safety	1,345,042.00
Department of Public Works	538,130.00
Department of Public Health	274,936.00
Department of Public Education	543,670.90
Department of Public Utilities	40,252.80
Municipal Auditing Office	28,392.00
Total	$2,884,249.70

The obvious deficit is $914,252.70. But in order to arrive at a real estimate of the probability of self-support, there must be added to this the provincial subsidies amounting to $240,000 and the land sales amounting to $64,520, thus bringing the deficit up to nearly half the total expenditure. A readjustment of spheres of taxation between the city and provincial governments will be necessary before the municipality can properly adjust its finances.

Meanwhile another long step ahead has been taken in the establishment of a department of audit to audit the accounts of the municipal government and to submit monthly statements, which are to be made public by the executive council. Annual reports are also provided for. Here indeed is a new departure in Chinese governmental affairs. If Canton can actually put into practice the idea that public money must be accounted for to the public she will highly deserve the gratitude of the whole country. The auditor is to be appointed by the civil governor and must be a man of special training in accountancy. His salary is fixed by the charter at $400.

As its title indicates, the present charter is provisional. After it has been in effect for five years, the civil governor *may* appoint a revision committee to draft a new charter and submit it to the provincial assembly for final approval and adoption. The fate of the experiment thus rests entirely in the hands of General Chen Chiung-ming or his successor. By the control which he retains he may make or break the cause of self-government in the capital city of the South. The drafting of a permanent charter which shall vest the control of the government entirely in the hands of the people of the city depends upon his favor. But what he has granted has been granted freely and is earnest of his sincerity. He has followed his action at Canton by granting a charter at Swatow, and now Wuchow, the largest city of Kwangsi, has received a similar document. It is an experiment under auspicious circumstances and will be watched with interest by those who are striving for China's advancement.

American Firms in China

NEARLY 500 concerns established entirely by Americans and American capital are operating in China, says a Washington report. American concerns represent approximately six per cent. of all the foreign firms doing business in the Chinese republic, In 1920 alone more than 400 American concerns opened for business in China. In 1914 there were only 136 American companies here. The growing friendship of Chinese business men for American companies, and their seeming preference for American-made goods is causing concern to the business men and exporters of England, France and Germany, according to records of the department of commerce.

More than 7,000 American business men are devoting their entire time to managing their concerns in China. A far larger number of American manufactures and exports have a direct interest in the republic through a continuous exchange of commodities and raw materials. In addition American financiers are interested through loans made to the government. A large number of Americans hold bonds of the Chinese republic. The exact number is not known, but it is understood to be well into the hundreds.

Cheap Western Labor

ACTING Commercial Attaché Butts, at Tokio, reports that the output of pottery has fallen off about 30 per cent. in Nagoya and the industry remains in a depressed state. The glass industry is in even worse condition, several of the larger plants having practically shut down. The trouble seems to be inability to compete with cheap Occidental labor.

Get that last sentence. Japanese industries are shutting down because of inability to compete with "cheap Occidental labor." Japan is a part of the Orient, of course, and the Occident is always complaining about the cheap labor of the Orient. And here is the Orient complaining about the cheap labor of the Occident. Like as not the first thing we know the people of Japan and China will be asking a tariff against our cheaply produced American goods.—*Joplin Globe.*

The Railway Concession in China

(*Contributed*)

To China the word "concession" has always been "anathema," recalling the great humiliation of 1895, when Japan exposed to the Western powers, China's true value as a military power.

The Chinese Eastern Railway concession was the offset for Russian aid, which secured the retrocession of the Liao Tung Peninsula on the termination of the Japanese war. The Yunnan Railway was the French reward for friendly and traditional co-operation with Russia for the same ends, while the Shantung Railway was a purely commercial transaction, drawn on lines quite usual elsewhere, with the vital omission that China did not receive the usual monetary compensation. This feature characterized all three concessions, though in the case of the Chinese Eastern Railway there was mention of a payment of 5 million taels, a condition tacitly ignored until the present year (1920) when China again assumed a degree of control over the railway.

The conditions of all these concessions were curiously vague and the reverse of what are usually considered vital conditions. Generally, the concessions give the impression of a half learnt lesson in Western cunning or divided counsels on the question of confidence in European advice. Thus the Chinese Eastern Railway agreement gave Russia exclusive mining and development rights over a zone bordering the railway whose extent is left undefined. It is definite enough on the 36-year clause after the lapse of which China might purchase and also on the question of cession to China free of cost after the lapse of 80 years. Again in the Yunnan Railway, the French have neither police nor mining rights, but there is a vagueness over the questions of cession or purchase, an omission probable accounted for, by the fact that Yunnan is a far cry from Peking and the natural obstacles enormous for railway construction which would make the extension of this line a menace to regions were Chinese rule was worth maintenance. The absence of police and mineral rights is also perhaps an indication of the appreciation of the secondary role played by France in the Russo-French combination. Further in the case of the Shantung Railway though mineral rights for a distance of 10 miles on either side of the line were ceded, and Germany acquired exclusive rights for the creation of a railway system for Shantung, China merely reserved the rights of purchase at some unspecified date. A feature of all the agreements was the insertion of a clause stipulating that work was to begin within six months of signature. This clause was more honored in the breach than the observance, as China was in no position to insist on its compliance.

As a whole, "force majeure," was too evident in the initial stages of all three concessions, but only in the case of the Chinese Eastern did this state of things persist. In Manchuria, Russia pushed through her great scheme at a speed which only the presence of foot, horse and guns continually at hand could have secured. In five years, the Chinese Eastern Railway and its branch to Port Arthur (over 1,500 miles) was virtually a *fait accompli* and Manchuria, a Russian dependency as regards the railway zone; But Russia spent money in the country in prodigal fashion, provided employment for thousands and golden opportunities for the exercise of the trade genius of the Chinese. Also to a certain limited extent, though the commercial aspect of the scheme was obscured by the strategic, the country benefited from the provision of railway transport, and the consequent opening up of new or more distant markets for the products of an extremely rich province. These benefits would never have been so quickly secured under a dilatory and ultraconservative empire, which, though harried and cajoled by Li Hung-chang with a persistance and energy which always characterized him, took 16 years to complete 262 miles of the Peking-Mukden Railway.

In the case of the Shantung Railway, a thoroughly business atmosphere characterized its outward operation, but there was always the garrison of Tsingtau in threatening proximity. Another feature was a thorough and exclusive protection of German trade interests which stifled all attempts at foreign competition. Germany however loyally abided by her undertaking not to transport troops out of the Tsingtau zone unless the situation got beyond the control of the local authorities, and even went so far as to assure the United States in 1902 that she considered her rights in Shantung as in no sense constituting a monopoly. Unquestionably the creation of these two railways and above all, the ports of outlet, Dalny and Tsingtau, enriched China's revenue earning capacity. The material welfare of the people in the railway zone was advanced. Dignity was doubtless offended, but a dignity which relies for support on the traditions of a splendid past is bound to suffer in contact with those for whom the past has no appeal. Perhaps the denial of the right to obstruct was the greatest wound to Chinese pride.

As for the French concession of the Yunnan Railway, construction was delayed till 1904 and when put in hand, proved enormously costly both in lives and money—a tax on a new colony out of all proportion to the benefits conferred and a staggering financial burden added to the generally unproductive French colonial empire.

Thus, as a result of great expenditure, France established a sphere of influence, which may have a great future but only as the result of further colossal financial effort. France further exercises control over a railway which is a perpetual tax on colonial revenues, while China benefits by increased accessibility to a hitherto secluded and isolated province, and further, to the extent of customs revenues, which, but for the railway, would never have been feasible of collection.

Without doubt, the settlement of Russo-Japanese differences in 1904 on Chinese territory was a highly reprehensible proceeding, but here again some localities are fated for these decisions, for just as Belgium is the battlefield of Europe so was Manchuria fore-ordained as the place of impact for Russia and Japan. The railway merely localized the fighting and devastation and probably hastened the end, and who is to deny that Chinese sutlers and camp followers reaped a golden harvest during hostilities. Again China profited by the Japanese victory in the substitution for Russian muddle, drift and corruption, of a Japanese administration over the southern 500 miles of the Chinese Eastern Railway (from Dalny to Changchun). This administration has been remarkable for its efficiency and its vast development schemes in which the Manchurian population share, to a very considerable extent.

Then, without a doubt, considerations of sentiment aside, China's concession railways have not served her badly. Materially, they must have all assisted her and China now exerts a divided control with the Russian shareholders of the Chinese Eastern Railway, a control which the powers will without question preserve.

It will not be denied that China suffered moral wrong in being coerced into modernization, but ethics have no influence with peoples with the calls of empire to satisfy and the wherewithal that brooks no opposition. China should be thankful that she was never called upon to guarantee a purely strategic and unproductive railway as Persia was by Russia in 1912, and that she has never groaned under the burden of a kilometric guarantee.

This form of guarantee, under whatever conditions, is the sort of gilt edged ultra-profitable security which all railway concessionaires dream of, but fortunately for the exploited, few obtain. Briefly, this form of guarantee ensures a perpetual dividend without the effort to earn one; there is no inducement to develop traffic, the line must be maintained to carry a specified number of daily trains for which the rolling stock may be adequate or the reverse; in short, everything in the agreement is carried out to the letter and nothing further. This pernicious system is a feature of some of the Macedonian Railway agreements, and of some of the French concessions in Syria, but the Bagdad Railway and the Anatolian system from which it originated, are the most fantastic examples of outrage on intelligence and contemptuous exploitation which reveal the rottenness of Turkish officialdom and German moral turpitude.

This concession was the outcome of the Kaiser's second visit to Constantinople. Its salient features were as follows: The company was Turkish but the perpetual predominance of German control in this company was amply secured. The concession was for 99 years and the terms of cession to the Turkish government absolutely prohibitive. Construction at any time could be indefinitely delayed. For each 200 kilometre section the Turkish government was called upon to guarantee bonds to the amount of 54 million Francs, irrespective of the character of the work. The working of this clause is well illustrated in the construction of the first 200 kilometre section between Konia and Eregli. The loan for 54 million francs was duly floated and realized £1,868,000 or £14,944 per mile. The actual cost of the 125 miles (200 kilometres) cannot have exceeded at most £5,000 per mile, or a total of £625,000, so that the company pocketed £1,243,000 and realized a profit of 400 per cent. This section was completed in 1904 and there is no construction difficulty east of this until the Taurus Mountain Section (built during the war) is reached. Consequently, even if the company were compelled to disgorge for this most costly bit of work it was not until they had had the use of this money, and any added profits, for over 15 years. Even then, it is a question whether this section was not constructed by combined Austrian and German governmental agency. Further, for working expenses of the line, the Turkish government agreed to a guarantee of 4,500 francs per kilometre and as the Bagdad Railway Company handed over each section to the Anotalian Railways to operate when completed and paid them at the rate of 3,700 francs per kilometre, the company again made a certain and unearned profit on operation.

The holders of the Turkish government bonds sold for the construction of the line, had no voice in the management which was entirely vested in the company, whose capital was only 15 million francs half piad up. Turkish capital liability for each section could not exceed the above 54,000,000 francs—a tempering of the wind to a lamb already very much over shorn—; for in addition to the burden of the Bagdad Railway, Turkey had agreed to a kilometric guarantee of 15,000 francs per kilometre on the 587 kilometres of the German-built and controlled Anotalian Railways. It is calculated that the kilometric guarantee cost the Turkish taxpayer £9,000,000 between the years 1889 and 1907.

All told, the German railway ventures in Asia Minor must have given satisfaction to the Kaiser, who was, in the main, responsible for them. Germany became paramount at Constantinople and with consummate cleverness retained her supremacy through the revolution of 1908 and the débâcle of 1912. Turkey has the empty satisfaction that if her money went to enrich the German concessionaire it was returned many times over in order to equip her in a fight against her old time ally Great Britain, who, but for the Russian bogey in India and pre-occupation in Egypt, might have elected to defend her interests in Asia minor and saved Turkey from herself.

Turkey's railway history shows the darkest side of the concession question and is the exception which proves the rule. If we turn to South America a very different state of things prevails. The prosperity of the greater South American republics is undoubtedly due to the wholehearted adoption of the concession principle, particularly as applied to railways, docks and harbors. Isolation and the Monroe doctrine, forbade the use of concessions as weapons for empire builders. The concession became in South America a hum-drum business proposition, with no political furture before it, no nucleus for magnificent and megalomniac dreams, divorced entirely from romance unless local revolution is considered, and this could only end in the bathos of distraint for damage sustained. Thanks to the United States, South America will never witness "a battle of concessions" or be the victim of "conquest by railway and bank" and will never undergo that sure process of strangulation which follows the creation of a sphere of influence which begins with protestations of goodwill and ends, in some cases, with the organized regrettable incident, which is the prelude to "protectorate and national death."

South American history since the beginning of this century is a record of progress extraordinary. The greater republics have learnt the futility of revolution and grasped the fact that governmental stability ensures the flow of foreign capital necessary for the country's development. Thus, it is estimated that the investments of Great Britain alone in Latin America are in the neighborhood of $4,000 (gold) million, while Germany, France and Belgium have put another $1,000 million into the country.

The bulk of British money is sunk in railways, docks and harbors, which have been financed of concession lines and are the absolute property of the concessionaires. In the Argentine alone, British money to the extent of $1,000 million dollars has been invested in concession railways. Here the concession principle is so general that in 1909 what is known as the Mitre Law was introduced for the future regulation of railway concessions. Previous to this each railway controlled the terms of its own concessions but from this date onwards all concession railways are exempt from all national, provincial and municipal taxation and import duties on material until the year 1947. The railways pay to the government a single tax of 3 per cent. on the nett earnings, the amount of such earnings to be ascertained by deducting 10 per cent. from the gross receipts. The result of the use of the concession principle has been that the Argentine has been provided with a railway system, of 21,000 miles built and maintained to first-class standards and adequate to develop the land which the natives have been, and are now doubly so, careful to keep in their own hands. The trade of the Argentine between the years 1904 and 1913 increased 108 per cent. and was valued at over $996 millions in the latter year. The credit of the country is now exceptionally good whereas in 1890, the dawn of the era of regeneration, and the date of the last revolution, she was practically bankrupt, beggared by unparalleled corruption and internecine strife. Could there be a stronger testimonial for the concession principle, for the railways made the prosperity of the country and owe their origin to it. The Argentine is no exception either, Chile, Uruguay, Brazil, have all made the fullest, freest use of the nations with money to lend, to their unquestioned lasting benefit.

To turn elsewhere in the world, even Portugal has been driven to the granting of concessions for the development of her burdensome African colonies. This was not done without a wrench, for Portugal is very jealous of the safety of these links with past greatness. Besides, the colonies provide a host of sinecure appointments for the official classes and as this class more and more tends to become the bulk of the population, their retention at all costs becomes a necessary undertaking of the rapidly changing governments. Where unfertilized by capital these outposts of Portuguese Empire are a uniformly barren and melancholy spectacle. The Portuguese is no pioneer, he clings to the stifling coast towns. These towns in every sense are moribund, dying under the influence of climate. This state of things will persist until the absurd tariff laws are repealed (absurd inasmuch as Portugal is not a manufacturing nation) and foreign capital encouraged to the utmost, instead of, as in China, being given a grudging suspect and obstructed admittance.

If then China is reluctant to do business with the consortium, she would do well to revise her decision with regard to concessions. China would profit exceedingly could she rid herself of the tendency to be swayed by canards and catch words. This is an unfortunate Chinese trait, due to an age old system of education, which tends to develop memory more than reasoning faculty. Moral saws proverbs and catch words thus acquire undue importance and exact unreasoning obedience. This is why "concession" has become a synonym for disruption and national destruction and explains the limited success of the interested and instigated campaign against the consortium in which the slogan has been "sovereignty and monopoly."

At all costs China must have foreign capital. There is room enough for the consortium and the concession system of raising it, but a preliminary must be the adoption of a more trusting attitude and realization that the country is no Eldorado which the nations of the earth will scramble to finance.

Development of Rolling Stock on N.E.I. Railways

(Compiled by the N.E.I. State Railway and Tramway Office)

IN the December number of The Far Eastern Review we described the development of the locomotive rolling stock on the Netherlands East Indies Railways. The history of the development of the freight and passenger rolling stock may be briefly sketched as follows :

Until the year 1894, nothing but *two-axled* trucks or cars were in service. In 1895 the first *four-axled* box cars came into use. Since then, trucks having a fixed wheel-base of 1.50 M. have been imported for high open goods-wagons and flat cars, as well as for the type already mentioned above. In 1904 the allowable load of the two-axled wagons was increased from 8 to 10 tons, which could only be done after the old axles with thickness in the hub of 100 mm. and a journal's diameter of 80 mm. had been exchanged for new ones with 116 mm. thickness in the hub and journals with 90 mm. diameter.

During the war, when no new rolling stock was coming out, the scarcity of cars was so great that it became urgent, by way of temporary measure, to increase the allowable load of the two-axled cars from 10 to 12 tons, and that of the four-axled ones from 20 to 24 tons. Meanwhile axles of 125 mm. hub-bore were already, and for that matter, still are, being ordered, so that by degrees the replacing of the thinner axles by thicker ones will render the temporary measure a permanent character.

The following are special cars :—

No. 1, see page 108, is a six-axled well wagon running on 2 three-axled trucks, designed for the transport of heavy, bulky engine parts, total length of frame 18.70 m. ; available length of the well ad 10 m.; carrying capacity 30 tons.

Furthermore a steam wrecking-crane on 6 axles weighing in working order about 60 tons with a greatest capacity for lifting 15 tons at a swing of 9.15 m., and a lifting-speed for the same load of 7 m. per minute.

Moreover there are 35 "breakdown" vans placed at various stations ; these are box cars provided with complete inventories, which contain various toots and implements for clearing away impediments and wrecks.

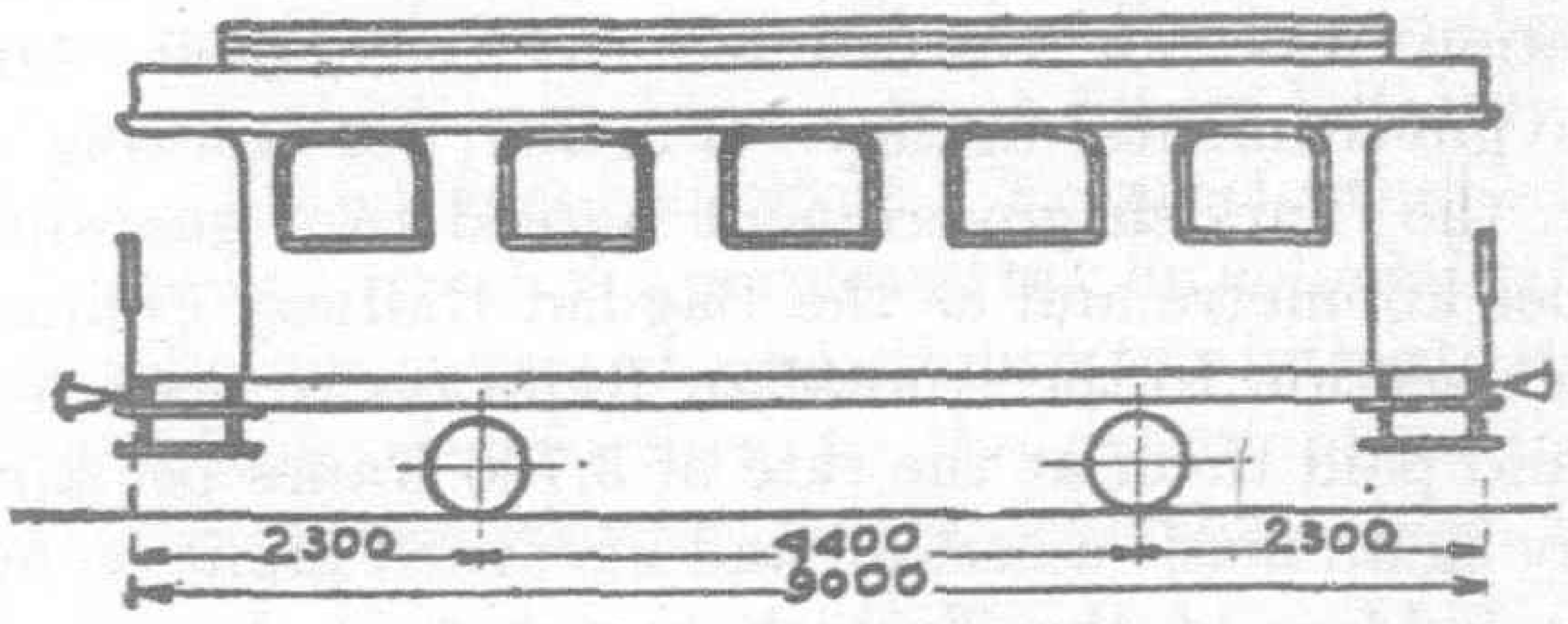
If it was possible to manage for a long time with 2 axles and a fixed wheel-base of 3 metres for the cars, with the passenger-coaches the need of longer vehicles was very soon felt ; longer than would be possible with the 3 metres fixed wheel-base imposed by the mountain-lines with their minimum radii of 150 metres. This gave rise in 1881 to the importation of the first series of coaches carried on 3 what are called Cleminson trucks. By this system the three axles are placed in such a manner in frames coupled to each other, that the two outermost axles adjust themselves to the curves, whilst the middle axle has lateral play. With the increase of the speeds, however, these coaches proved to be unsuitable, also because they were too lightly constructed, and it was found necessary to use, by preference, bogie-carriages also for the sake of steady running. We find in the Kiebitz under frame and effort to render a longer wheel-base possible for mountain-lines whilst retaining two axles ; this design comprises two one-axled trucks.

On account of their insufficient strength these Kiebitz frames are gradually couverted into and superseded by frames with flexible axles (Lenkachsen).

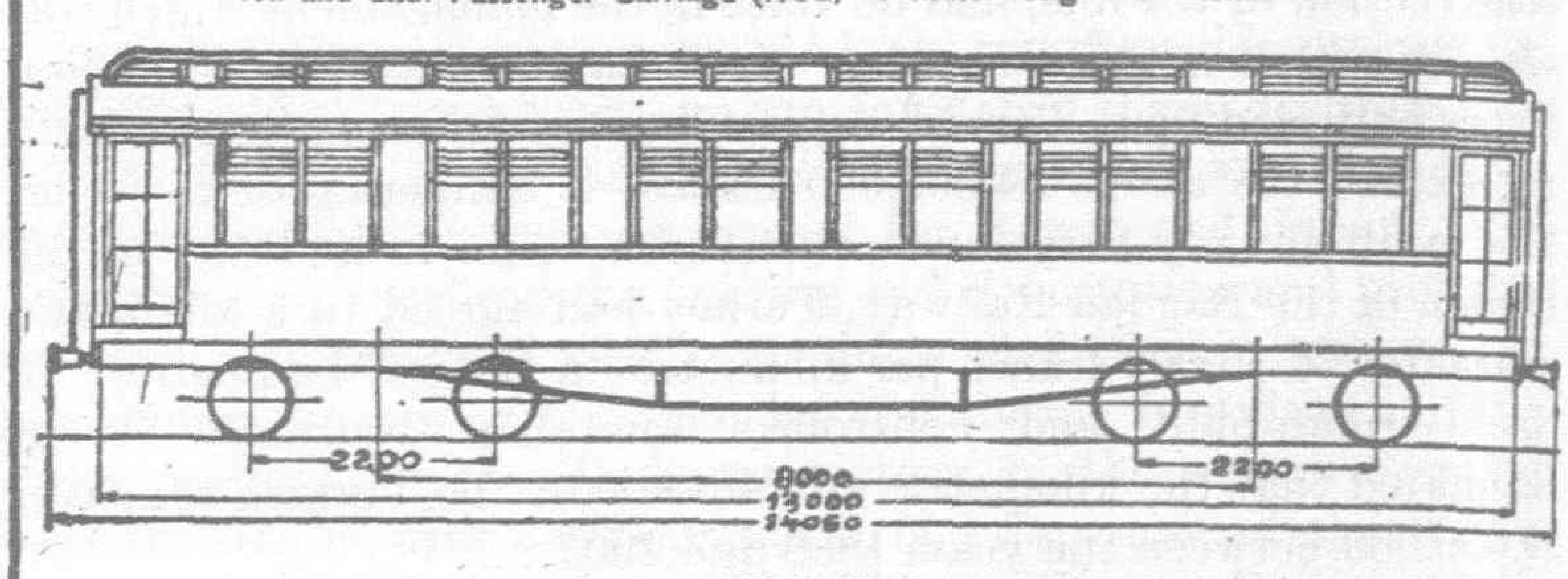
The first coach on two-axled bogies was the saloon coach of H.E. the governor-general, which was put into service in 1891 (now out of date and converted).

It was not until 1895 that a beginning was made with the regular building of coaches and luggage-vans mostly measuring a length of 13 m. and placed on two two-axled bogies. There are now various bogie systems in use, namely simple ones without a cradle, trucks with a "swan neck" equalizer, trucks with cradle hangers inside the frame-plates according to American and European practice (this system is gradually being superseded by that one with the cradle hanger placed outside the frame-plates) and trucks having the cradle-hangers and cradle-springs placed outside the

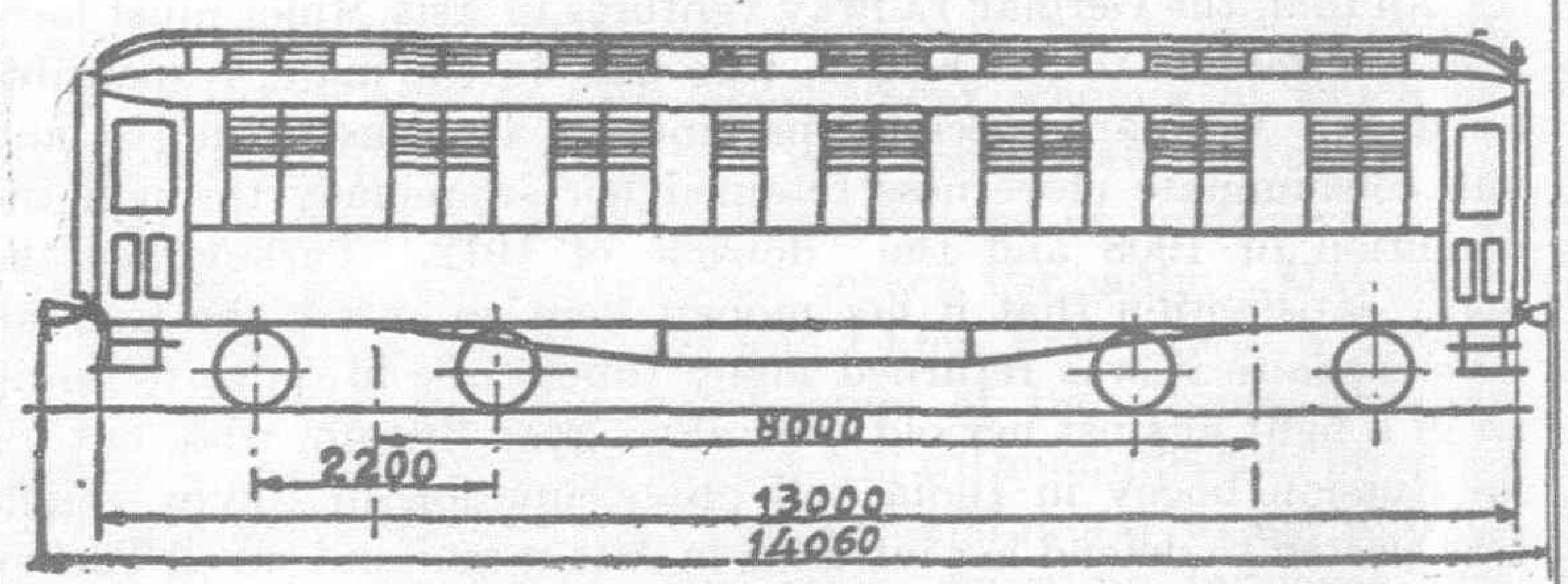
1st. and 2nd cl. Passenger Carriage (AB) 9 Meter long.



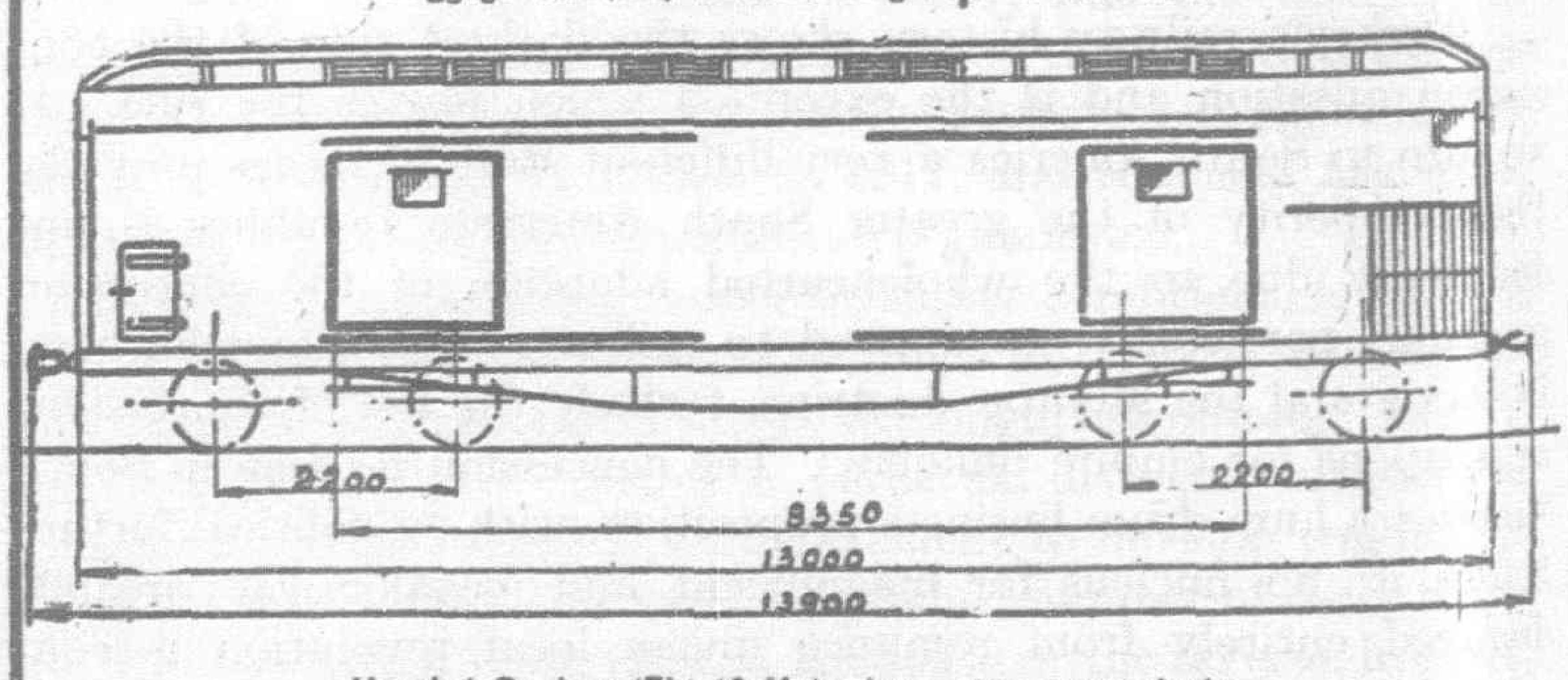
1st. and 2nd. Passenger Carriage (ABL) 13 Meter long with vacuum-brake.



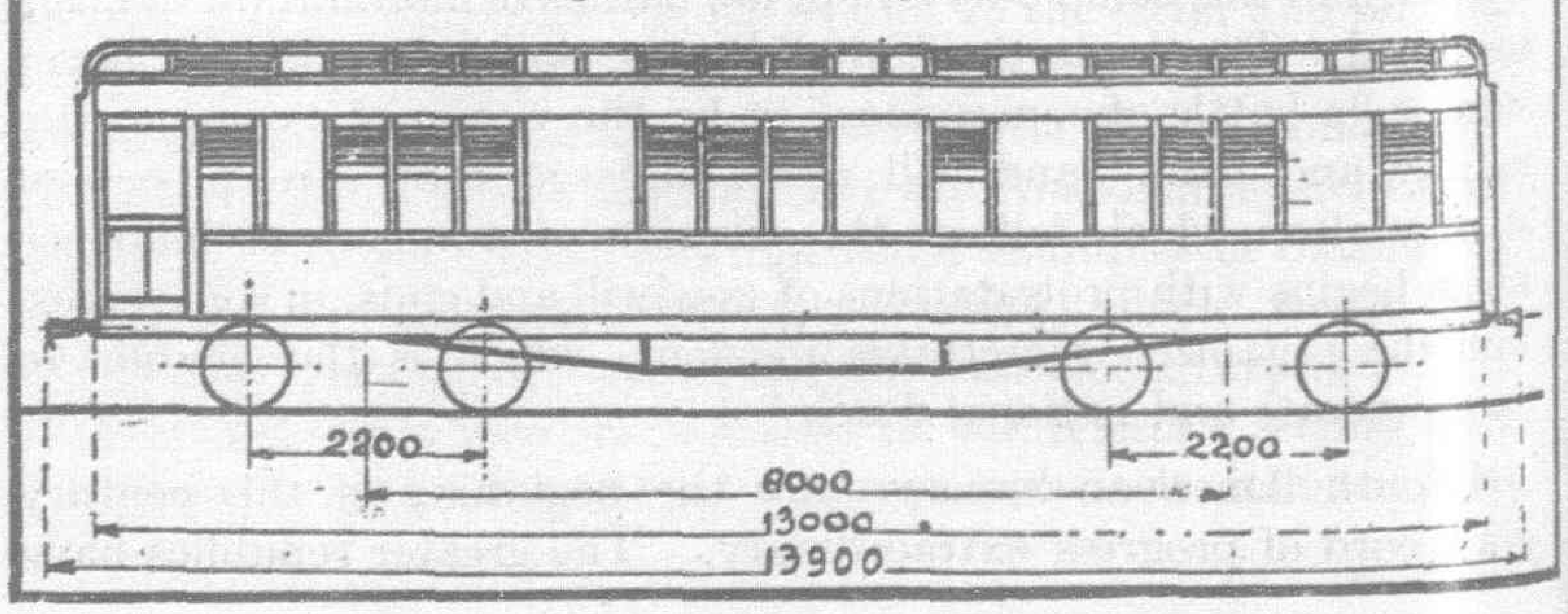
3d. cl. Passenger Carriage (CL) 13 Meter long with vacuum-brake.



Luggage Van (DL) 13 Meter long with vacuum-brake.



Hospital Carriage (EL) 13 Meter long with vacuum-brake.

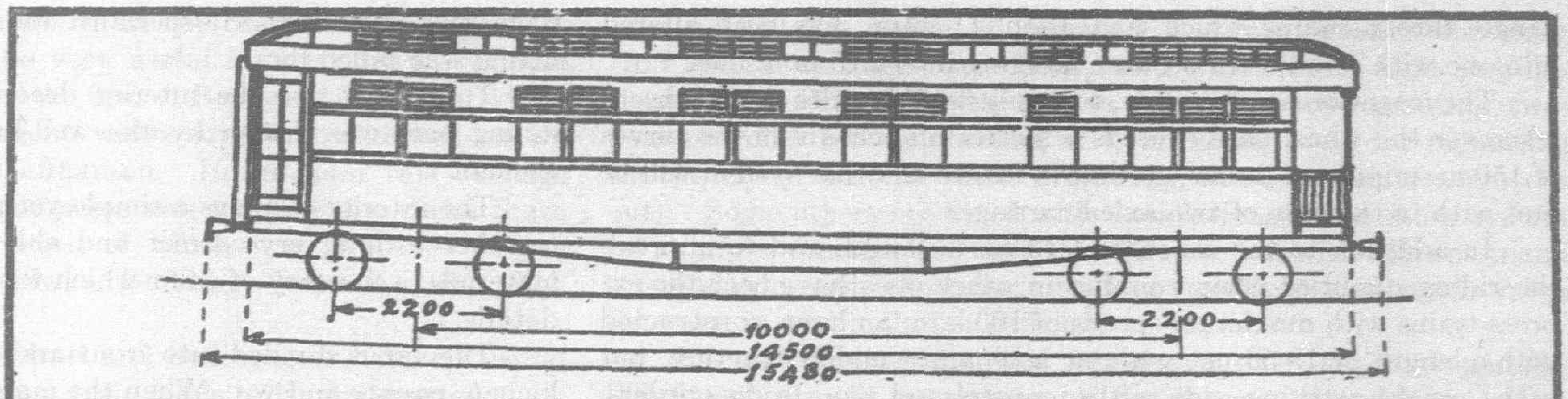


frame-plates. Experience has taught that copying the American cradle-trucks for adoptation on a 1067 mm. gauge, has not led to the favorable results which were expected, not even when the hanger-pins were replaced by kniveedges. It was only in 1908, when the hangers and cradle-springs were placed outside the frames, that a type of coach-truck was obtained which ran steadily even at the highest speed (100 k.m. an hour). Since then, this principle, which has given such excellent results, has been applied to all the new coaches (also to those measuring 18.5 m.)

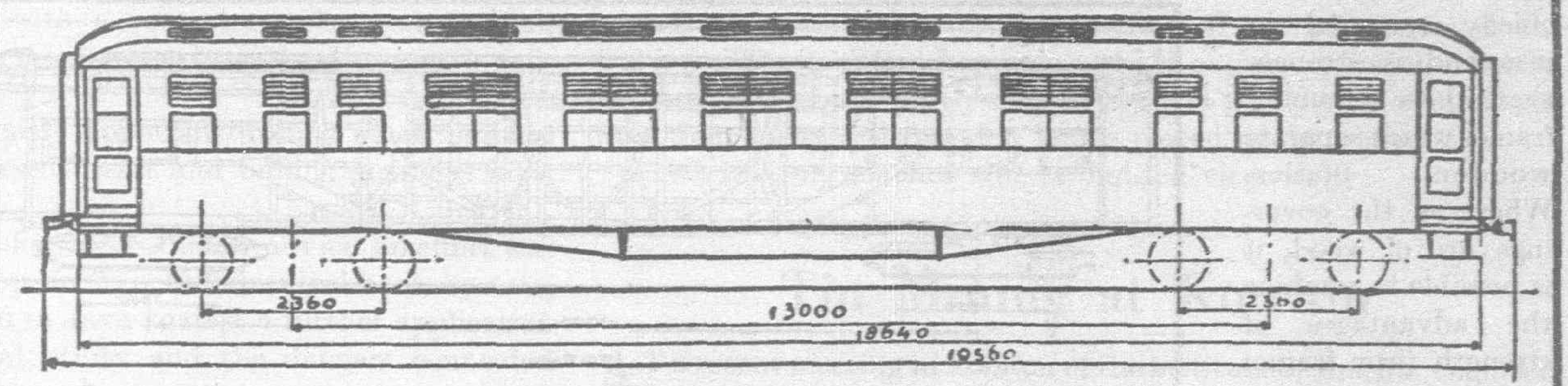
Also in order to increase the easy running of the coaches and to prevent any tiresome "rocking" movement, the old wheel-bases of the cradle-trucks have been increased from 1.50 m. to 2.20 m., which latter measure now holds good for all 13 metre bogie-carriages and luggage-vans with distance of 8 metres between the pivots. In the case of the 18.5 metre coaches, the wheel-base of the trucks and the distance between the pivots, are 2.360 and 13 metres respectively. It proved impossible to make them larger.

Experiments, begun in 1910, with a new profile for wheel-tyres proved, that the running of carriages was ably improved by rendering the side play between flange and rail-head smaller for the straight stretches by a moderate taper and still more by the profile of the flanges throat.

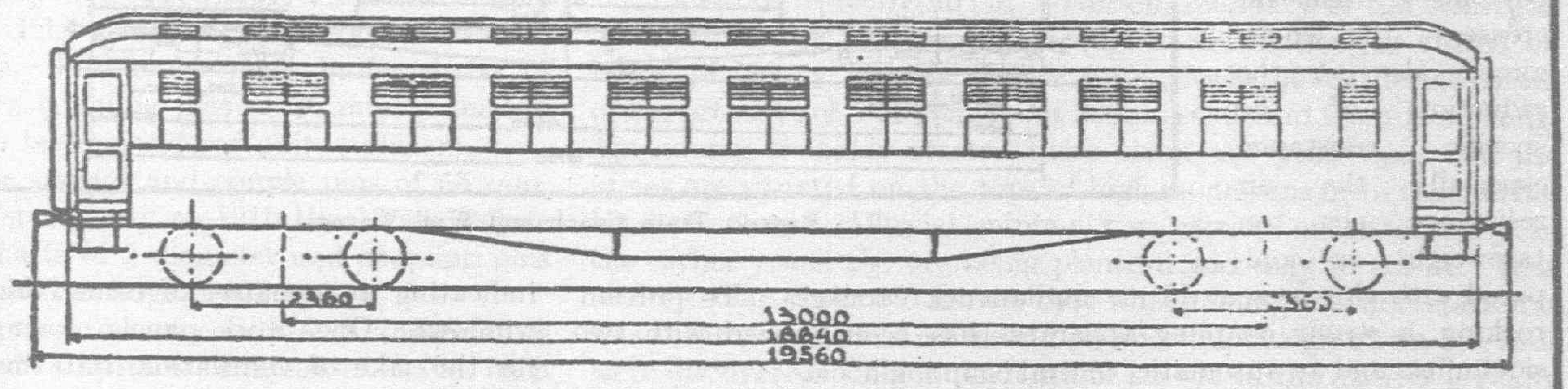
In consequence of this, the new tyre profile is gradually being introduced in accordance with which the flange is made thicker, the taper of the tread has been altered from 1/20 to 1/40, the outer taper from 1/10 to 1/8 whilst the former



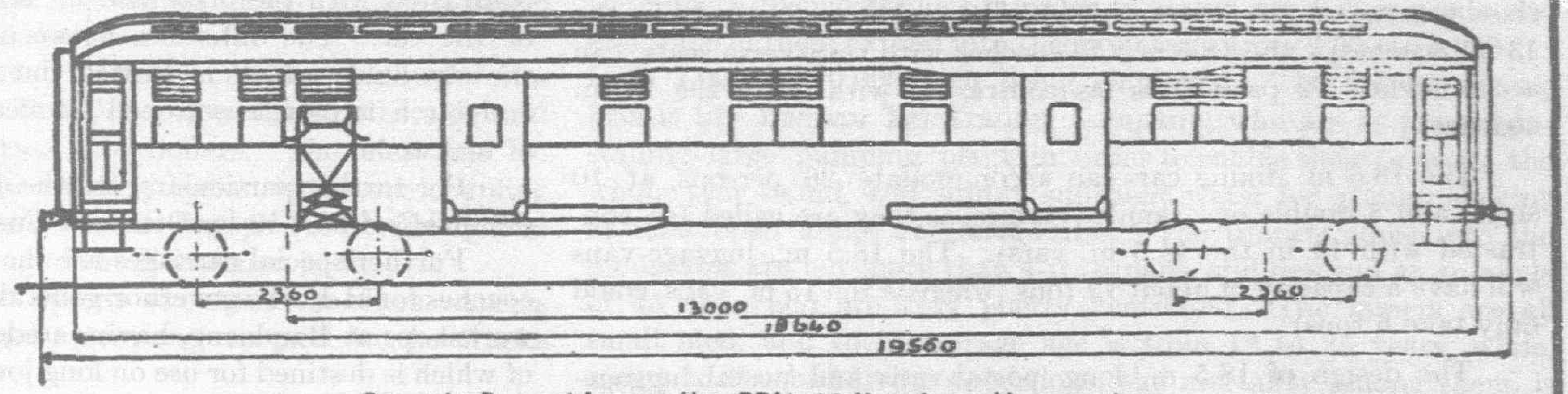
1st. and 2nd. cl. Passenger Carriage (ABL) 18,5 Meter long with vacuum-brake.



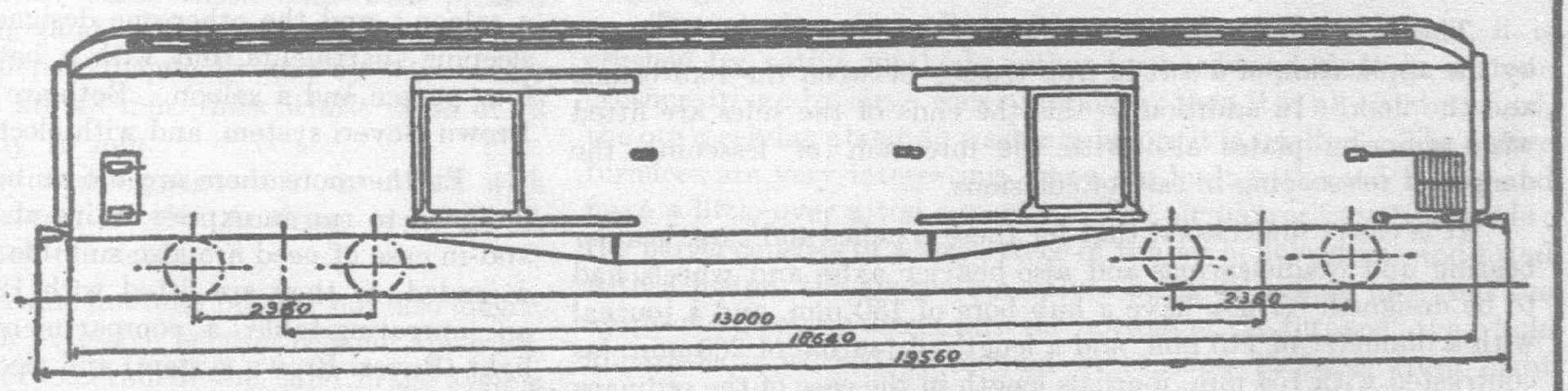
3d. cl. Passenger Carriage (CL) 18,5 Meter long with vacuum-brake.



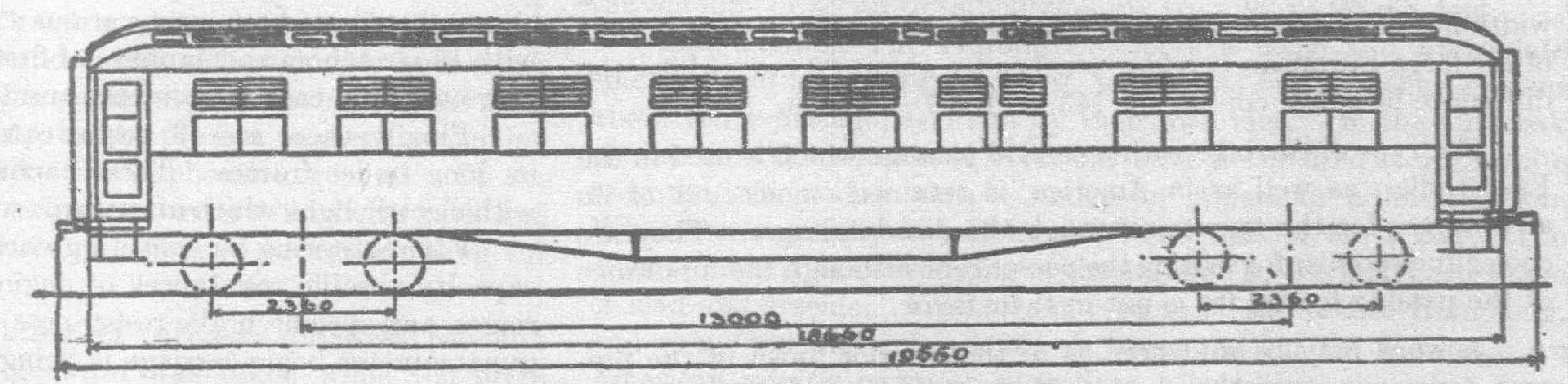
Post-Office Van (Post L) 18,5 Meter long with vacuum-brake.



Composite Post and Luggage Van (PDL) 18,5 Meter long with vacuum-brake



Restaurant Car (FL) 18,5 Meter long with vacuum-brake.

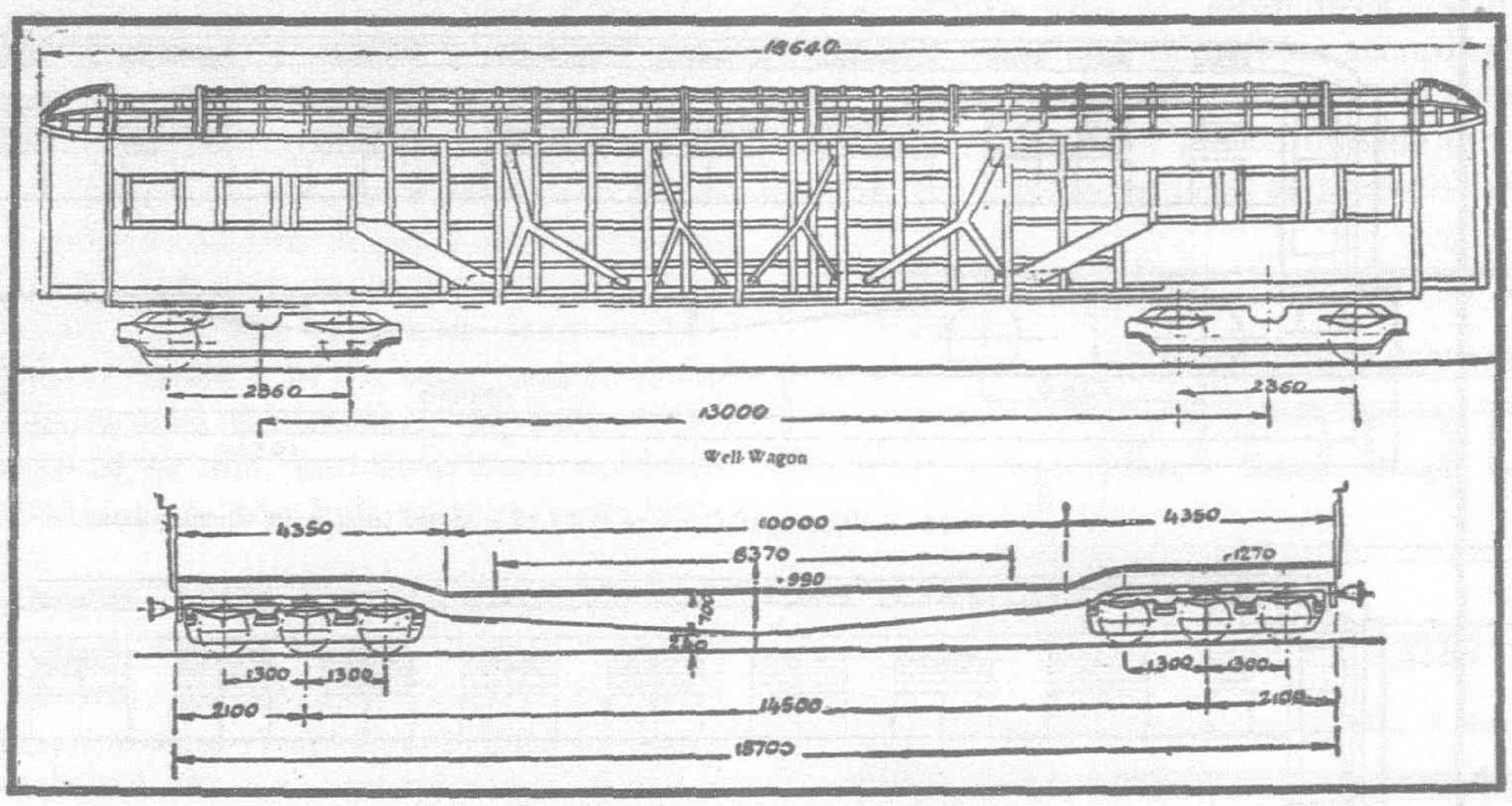


Structure of Supporting Sides of Carriages of 18,5 Meter.

flange throat radius which had been 11 mm., has been altered into one with a radius of 30 mm. merging into a 15 mm. one.

The intention at present is, to apply flexible axles (Lenkachsen) wherever the wheel-base exceeds 3 metres on account of the curves of 150 m. minimum radius, so that in future no other system will be met with in the case of two-axled carriages.

In addition to the coaches of 13 m. in length and to improve the riding qualities when running in other ones have been the express-trains with maximum-speeds of 100 k.m. an hour constructed with a length of 18.50 m., without a separate under-structure, but with weight-carrying side walls constructed like bridge-girders. This construction is chiefly executed in iron and is stronger than those of under frames which separate wooden bodies. Where as the coverings are of wood, it is possible to combine the advantages of strength (iron frame) with coolness (wooden coverings). The increase of the length aimed also at the reduction of the specific resistance especially the air resistance per ton tareweight as compared with the present 13 m. cradle-truck carriages. To prevent rocking, a strong coupling apparatus has been applied with two sidebuffers and an automatic, central coupling hook.



Express Train Coach and Well Wagon

The 18.5 m. AB coaches can seat 24 second class and 14 first-class passengers (as contrasted with 18 and 8 respectively in the 13 m. coaches); the 18.5 m. C—coaches with transverse seats, can accommodate 72 passengers (as contrasted with 55 in the 13 m. coaches).

The 18.5 m. dining cars can accommodate 26 persons, at 10 single and 8 double or "family" tables, as they are called (as contrasted with 14 in the 14.5 m. cars). The 18.5 m. luggage-vans will have a capacity of about 12 tons (whereas the 13 m. vans could only take 6 tons).

The design of 18.5 m. long postal-vans and postal luggage-vans, is at present under consideration.

The walls of these cars are rendered to enable it to carry weight by the application of a sort of iron trusses between the roof-beams and the floor. In addition to this the ends of the sides are fitted with armoring plates also with the intention of lessening the danger of telescoping in case of collisions.

It is easily understood that for these coaches and cars, heavier bearing and cradle-springs and also heavier axles and wheels had to be designed. These have a hub bore of 150 mm. and a journal with a diameter of 115 mm. and a length of journal of 200 mm. (as contrasted with 154 mm. journals length in the case of the ordinary axles of 90 mm. journal's diameter). It is worthy of note, that a width has been attained in these coaches which only differs from that of the large European corridor-coaches by about 20 cm., whilst the difference in gauge consists of 143.5—106.7=36.8 cm.

The type of carriage with a central passage which is used in the East Indies, as well as in America, is retained on account of its advantages for the tropics outweigh the disadvantages. They are cooler and roomier for seating the passengers, although the hindrance of the passing to and fro is not in their favor.

A word may be said here as to the interior finish of the present-day carriages. Already with the last number of 13 M.A.B. carriages the assistance of a specialist for interior panelling and outfitting was called for.

The design for the interior decoration of the latest 18.5 m. dining cars was drawn by the well-known Dutch artist, Willem Penaat.

The interior displays a simple yet pure design of the main lines together with a very correct and able application of color of the materials, a mastery of color which took care of even the smallest details.

The car is divided into front and rear platform dining saloon, kichen, pantry and w.c. When the main lines and form details were designed special attention was paid to the construction of the car, and the decorative architecture is of such a nature that the large panels are fixed by means of borders, straight onto the frame of the car.

In division of the panels, care has also been taken to connect the side-walls and the partition-walls in a satisfactory manner, so that a well-finished whole is the result.

The ceiling is divided into square panels, indicating as a matter of course the pace of the ventilators and windows. Open-work panels of an oblong shape are introduced for the sake of ventilation, into the sky-light, and these with the fretwork above the windows give a certain effect of lightness as contrasted with the otherwise for all character of the decoration of the car. The difference between the dark teakwood work and the sky-light, which is carried out in light-colored Swiss maple and birch triplex, is softened by means of three horizontal bands of teakwood.

For further particulars, see the article in the "Groene Amsterdammer" of 30.8.19 by Otto van Tusschenbroek.

Further special carriages are the following ones :—Two saloon-coaches for H.E. the governor-general, which were built at the main workshops at Bandoeng, having under frames 18.5 metres long one of which is destined for use on long journeys possessing two sleeping-apartments, a bathroom, and a sitting-room for four people as well as a saloon; and the other one designed for short journeys, without sleeping-apartments, but with a bathroom, two sitting-rooms for four people and a saloon. Both are fitted with electric light, on the Brown Boveri system, and with electric fans.

Furthermore there are too ambulance-cars with 13 m. frames designed to run in express-trains at a speed of 100 k.m. an hour, and in case of need are also suitable for the most transportation of wounded, as they are fitted with 12 stretchers, a medicine store, an operating-table, a compartment for six attendants, electric light (Boveri Brown system) and electric fans.

Moreover we find 35 Red cross vans on 2 flexible axles (Lenkachsen) distributed amongst various stations. Each van is equipped with 16 stretchers and supplies of first-aid material for the transport of wounded in case of accidents and in time of war.

Finally there are 13 postal carriages, on cradle-trucks on 11 m. long uuder frames. These carriages were originally fitted out with electric light which afterwards was replaced by aceton-lighting.

For registering ad collecting various data about tractive power capacity specific resistances of engines and various classes of carriages, and specific brake resistances the construction of a so-called dynamometer bogie-carriage is being considered so as to enable the future designer of rolling-stock to make a fruitful use of these data and to introduce improvements to of the designs. This dynamometer van which will also be very useful for drawing-up rational load schemes, will be built by the firm of Beynes at Haarlem, whilst the various registering instruments will be supplied by the well-known firm of "Amsler Bros." of Schaffhausen. In the main this carriage will be a copy of the dynamometer van used by the Swiss State Railways, a detailed description of which was published in the *Schweizerische Bauzeitung* (Swiss Building Journal), 1914, Vol. 64, Nos. 4, 5 and 6.

The development of the draft and buffing gear has kept equal pace with that of the maximum train loads to be transported.

As a peculiarity it may be mentioned here, that originally the rolling stock was fitted up with a central coupler system Pikl, such as is said to have been first introduced on the Norwegian railway in Europe.

Since it has been frequently applied to rolling stock built in England. From this the present draft and buffing gear has been developed.

In 1878, however, in defiance of Indian advice an effort was made to introduce the European two buffercentral-hook system, but at once voices were raised in Java against a further application of it after its small practical utility and the dangers connected with its manipulation had become apparent.

Carriages, fitted with this system of coupling, were immediately altered and fitted with the Pikl system with automatic central coupling without side buffers. For many years buffer shafts of 41 mm. diameter in the stern coupling pins of 36 mm. diameter, and 5-ton volute springs have been considered quite sufficient.

In 1909 the 7-ton buffer springs and couple pins of 55 mm. diameter came into use whilst as early as 1916 the 12-ton volute springs with fortified buffer shafts of 2 diameter and coupling pins of 55 mm. diameter were applied in large numbers.

As regards the buffer spring in connection with the existing other dimensions the utmost attainable dimensions have been reached. Should it be deemed necessary at any time to make the buffers, coupling chains, etc., heavier an entirely different model will most probably have to be designed.

As was already mentioned formerly coaches destined for a maximum speed of 100 k.m. hour have been fitted with a central automatic draw hook and two side buffers. The idea was, to combine the advantages of the existing Indian automatic coupling system with those of the system in use in Europe (with side buffers but without automatic coupling of the Norwegian hooks).

On account of the great speeds at which the Java express trains will have to run special attention was paid to the trucks and to the brake gear.

The newly designed trucks unlike those built with pressed steel frames should be strong (and stiff showing little elasticity. For this purpose they are stiffened) diagonally and by large corner plates. The broad pedestals are 48 mm. thick whilst those of 13 m. coaches and vans are only 16 mm.

Moreover these carriages and luggage-vans are fitted with vacuum quick-acting-brake-valves of the Austrian type A. T. and emergency-valves of 1 inch diameter.

When the goods trains became not only heavier but also longer, the difficulties connected with excessive lengths became apparent, with the result that by way of experiment the hand brake system was replaced by the vacuum brake on special goods trains chiefly for long-distance traffic. Although a series of cars were fitted with a vacuum brake for that purpose and although the authorities intended also to make use of the vacuum quick-acting-brake-valves of the Austrian type "K," up to the present moment no further steps have been taken to make the application general. Of the two types of automatic slack adjusters under trial (with rack and sector gear) the one with the sector seems to be better filling the requirements.

With regard to the lighting of carriages progress has also been made. A distinct step forward was taken when the original candles were replaced by paraffin lamps.

In 1910 the Aceton illumination was introduced whilst since 1917 several carriages have been fitted with electric light installations of the Brown Boveri system (with fine self-regulating two-position roller for maintaining an even voltage and for regulating the supply of current when eventually the accumulators are cut out). Some others are fitted with installations of the Stone system (of a simpler construction than the other one but with twice as many accumulators not regulating itself so precisely and much more sensitive to accumulators defects).

Electric lighting has the advantage over gas and paraffin lighting of causing no danger by fire in case of accidents, moreover the electric energy can be utilized for driving fans, which contribute considerably to the comfort of the passengers in the tropics. The intention has been to light express trains electrically, fast and slow trains partly electrically and partly with aceton, and the other trains with paraffin lamps placed in the ceiling.

All 18.5 m. coaches will be lighted electrically.

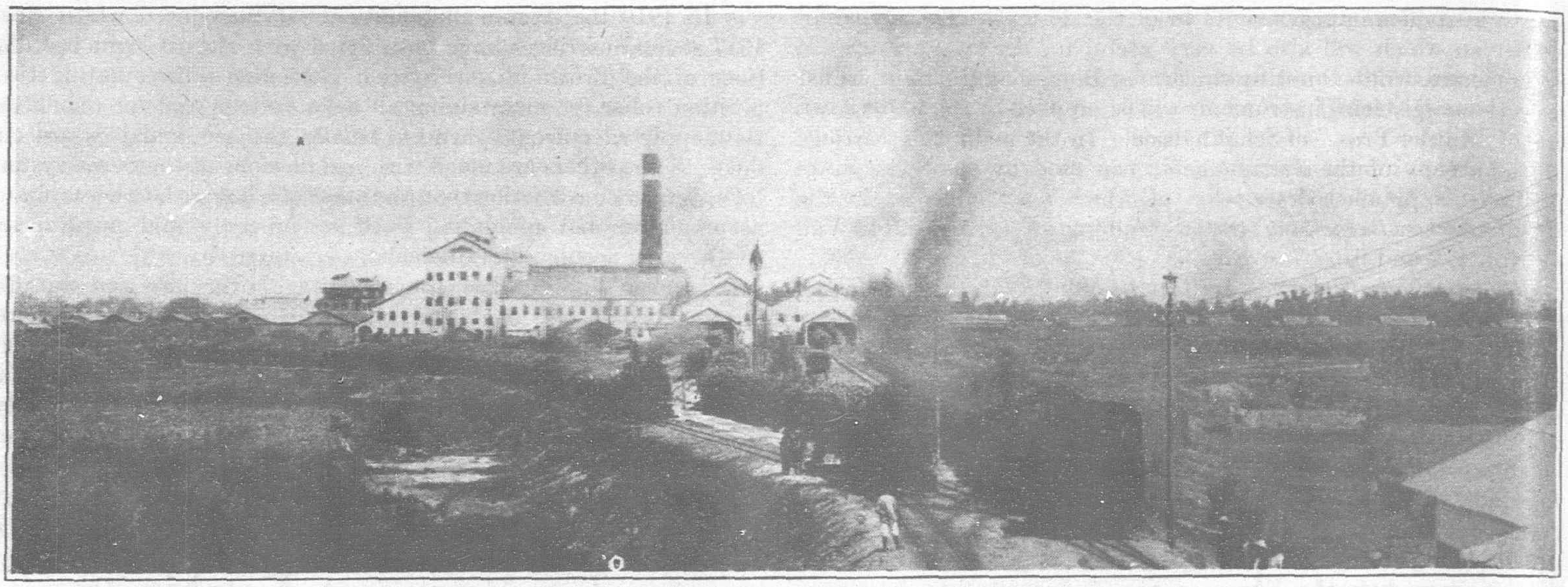
Tin Mining at Kotchiu

At a recent meeting in London of the institute of marine engineers a paper by Mr. Wm. Semple on this subject was, in the author's absence, read by Mr. J. Adamson, secretary of the institute.

The mining village of Kotchiu, which Mr. Semple visited on behalf of Messrs. Shewan, Tomes & Co., lies in the south-west corner of the province of Yunnan, about 800 miles distant from Hongkong. Tin mining probably started there about 400 years ago. All the mines are situated on the tops of high mountains or in the gulches between them. Alluvial mining was carried on extensively in the earlier years, the ore being plentiful and easy to get at. It is said by some of the old miners that when mining was first started it was to obtain silver, and during prospecting the great tin ore beds were discovered. The abundance of tin ore in the district is really remarkable. Although alluvial mining was carried on extensively, the miners opened tunnels in order to search for a finer grade ore, and some of these extend into the mountains from 2,000 to 4,000-ft., from 3,000 to 10,000 men being employed. The largest mining firm is the Yunnan Tin Trading Company, who are at present installing large pumping plant in order to enable them to work the whole year round, and supply sufficient water for ground sluicing at their open mines at Malaga Hill. The tunnels going into the mountains are not more than 4-ft. square, and descend at an angle of 45 deg., and are very poorly ventilated. The miners are all small men, and their average age is from 12 to 25 years, while, owing to the bad living conditions, the mortality among them is very high.

The ore is principally earth ore, and, after extraction, it is crushed by native methods, either by hardwood clubs or a stone crusher driven by large water-buffaloes; then it is all hand washed, the ore receiving about 40 washings before it is smelted. The native furnaces are very interesting—they are built with mud bricks and have a little over a ton capacity. The air blower is native made; the barrel consists of a large piece of timber hollowed out and fitted with a piston, the air-suction valves being of buffalo hide and the air discharge going direct into the bottom of the furnace: the whole apparatus is worked by manual labor, and it takes from eight to ten hours to make a cast. The smelted tin is run into sand moulds, the amount of metal obtained running from 92 to 99 per cent.

The Yunnan Tin Trading Co. have a large and up-to-date smelting and concentrating plant, which was built by the Germans about ten years ago, and run by their own men. On the outbreak of war the Chinese took it over, but have never used it until quite recently, when they put it under an American administration. When working fully it will handle 1,000 tons of ore a day. The chief trouble is in the refining of the tin, due to the high percentage of lead and arsenic. Formerly it used to be shipped to Hongkong, and re-melted and refined before being put on the market. An American mining engineer as well as a smelting specialist have been engaged to bring the tin up to the required standards.



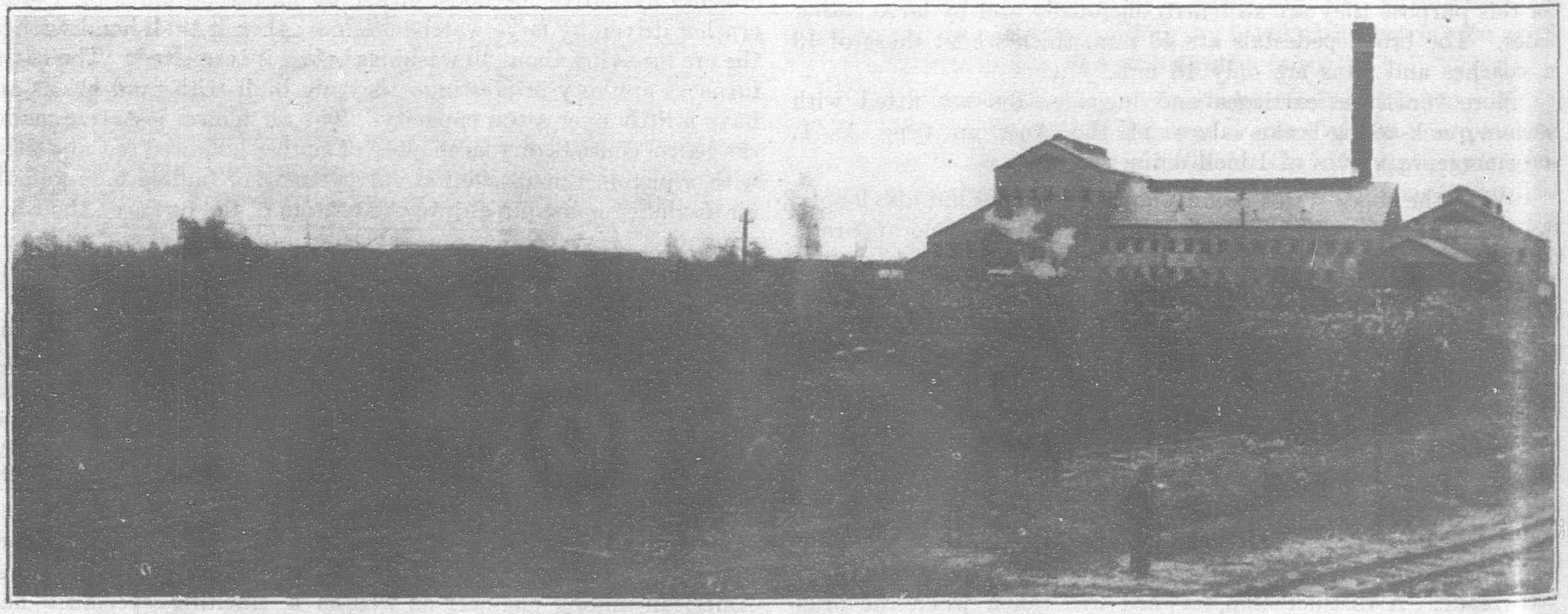
The Great Ako Mill of the Formosa Sugar Company

The Formosan Sugar Industry

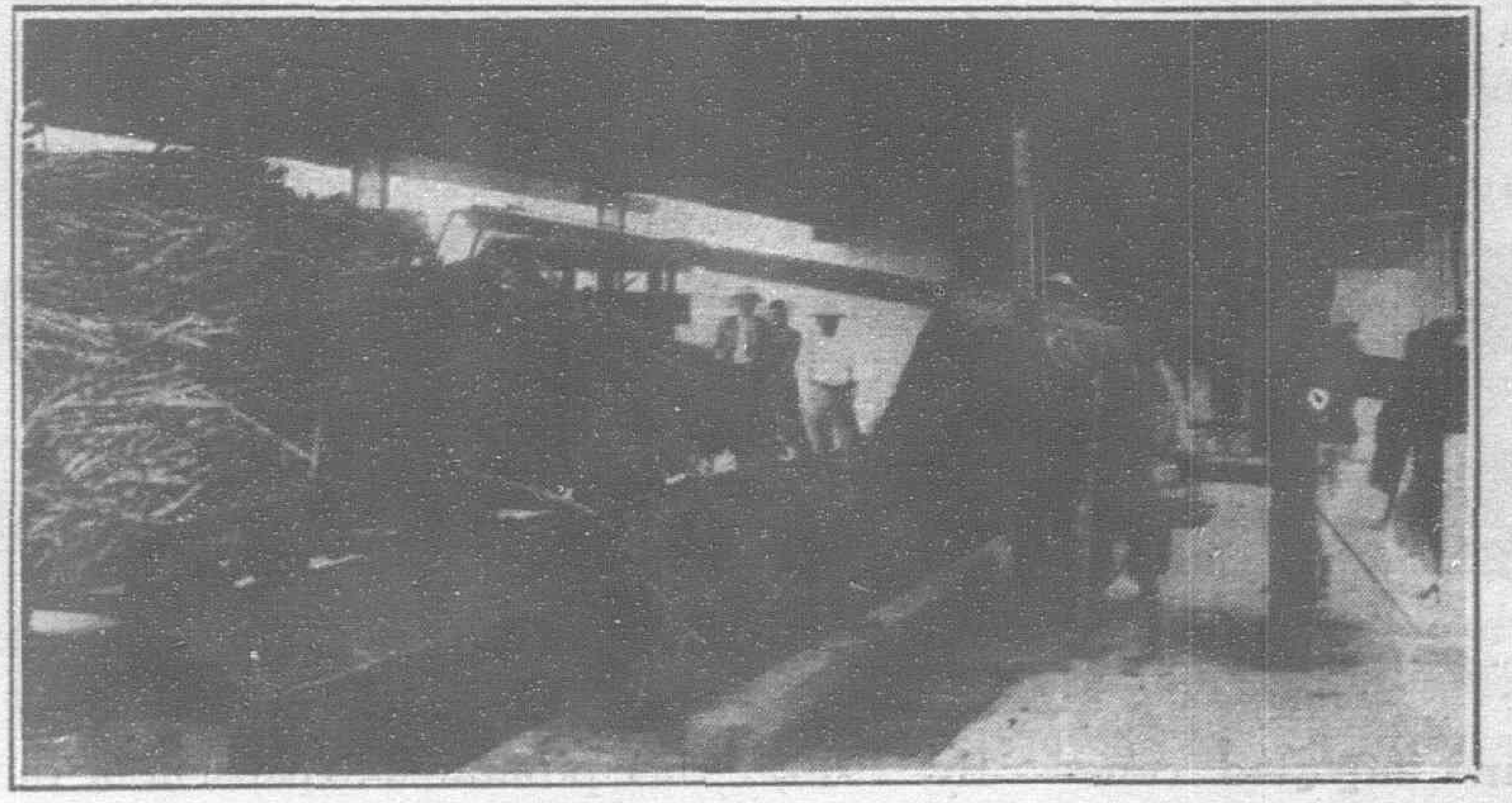
UNDER Chinese rule, the island of Formosa produced 60,000 to 80,000 tons of brown sugar per annum, of which, 45,000 to 50,000 tons were exported. The value of this product was about Y.4 per picul or $35 (gold) per ton, on which the Chinese government levied a duty of about $1.50 per ton.

The modern sugar industry in Formosa dates from the year that the island came under the rule of Japan as a result of the war with China in 1895. It was not however until 1902 that the Japanese government began to interest itself in the development of the sugar industry, when active steps were taken for its encouragement through the establishment of an official sugar bureau and the enforcement of stringent regulations. Erection of the old buffalo type of mill was prohibited and the installation of modern machinery made compulsory. Such radical measures of reform naturally provoked criticism and opposition from the owners of native factories, but they soon perceived that their real interests laid in adopting modern methods. Injustice sometimes crept in as the result of the government's policy to hasten the development of the industry by encouraging the formation of big companies to undertake the growing of cane on a large scale, but on the other hand, the policy was broad and liberal, especially in the matter of subsidies and assistance in various forms not only in planting but for the erection of mills. The liberality of the sugar bureau may be judged from the fact that in several instances mills obtained a subsidy of six per cent. on the paid up capital for a period of five years or assistance in the shape of a lump sum of twenty per cent. on the total value of the plant. Notwithstanding these liberal inducements to progress, the Chinese farmers (noted as being more conservative and backward than their compatriots on the mainland) refused to co-operate, compelling the government to take drastic measures to ensure the success of its experiment. In 1905, therefore, special regulations for the control of sugar mills along the lines of a law then in force in the Dutch East Indies, were placed in operation.

Under these regulations any person wishing to erect a modern style sugar mill had to obtain the permission of the director of the sugar bureau, and when that permission has been granted the director fixed the district within which the mill was allowed to collect cane for the use of the mill. When the limits of such a district were fixed or altered a notification is published in the official gazette of the Formosan government to that effect. These



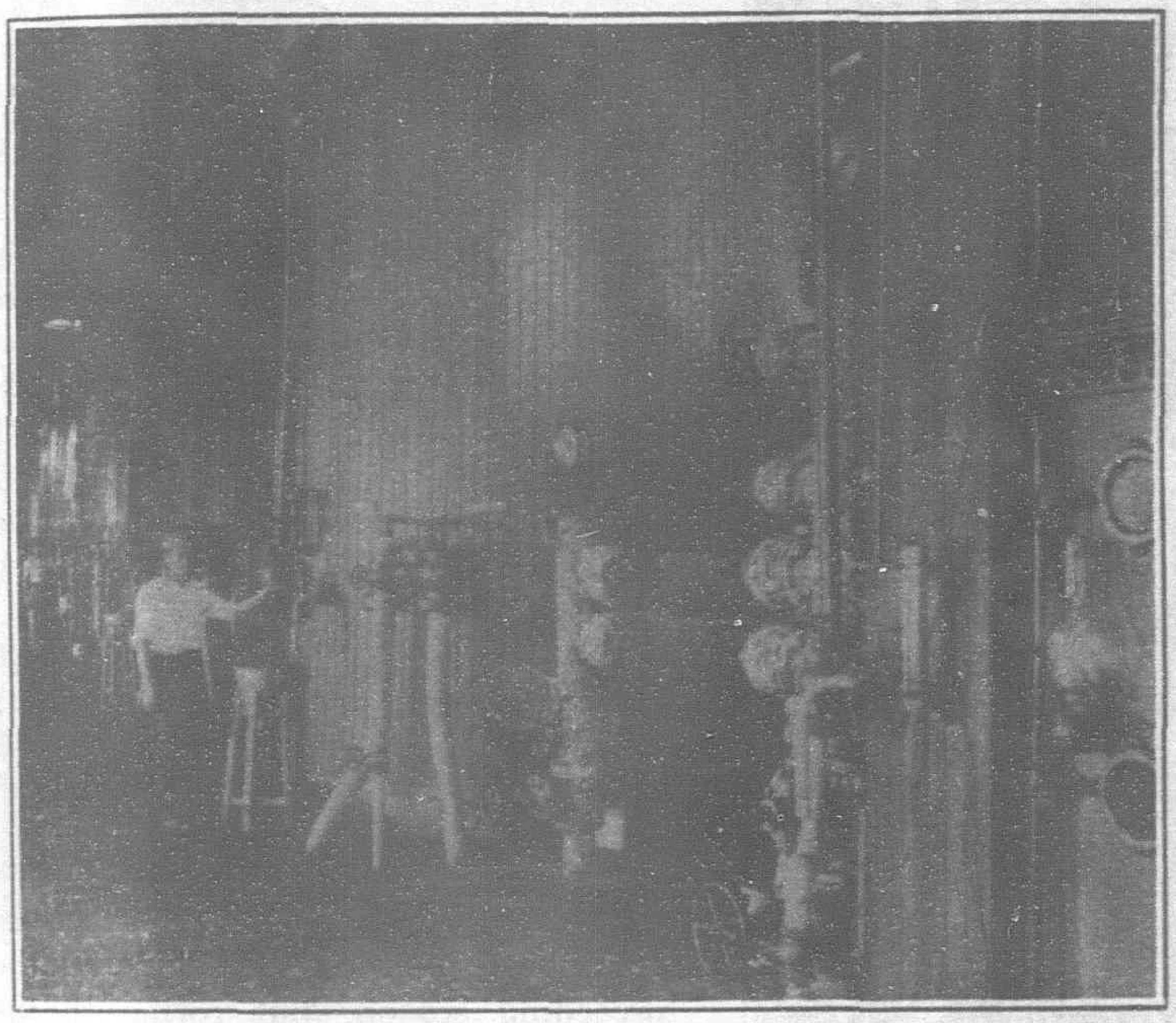
The Kohekirin Mill of the Formosa Sugar Company



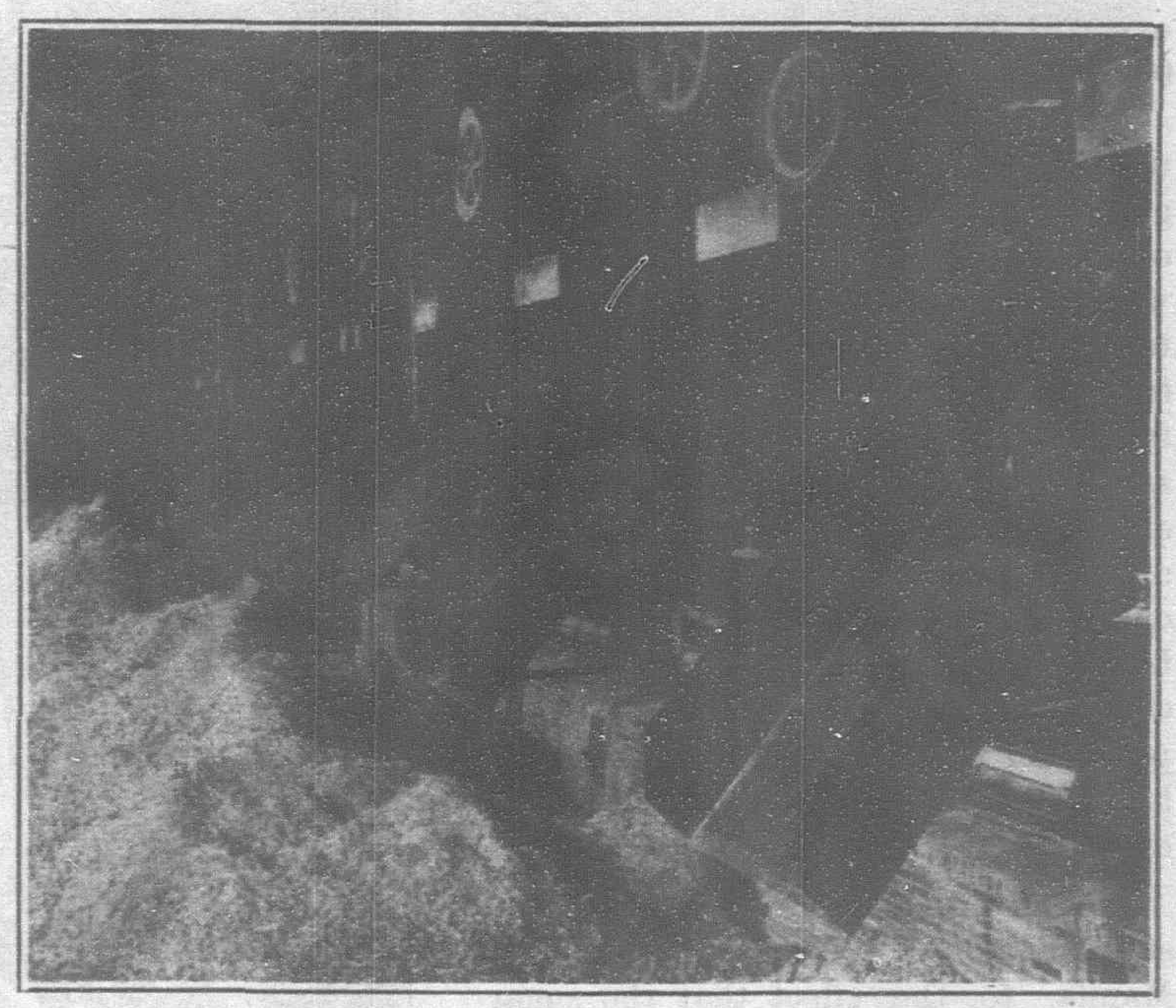
Cane Unloader at the Kyoshito Mill

regulations also provided that the farmers who occupy or cultivate land within any district allotted to a sugar mill, approved of by the sugar bureau, must sell all their cane to that mill, and no other mill may be erected within this allotted district. This meant, of course, that the sugar mill in any given district had a monopoly of the cane grown there by the farmers, who, moreover, were forbidden to sell their cane to any other district, or to use their cane for the manufacture of any other material except sugar.

Under the regulations of 1905 nine modern mills sprung up in two years, with a total paid-up capital of over Y.17,500,000.



Vacuum Pan Floor of the Ako Mi

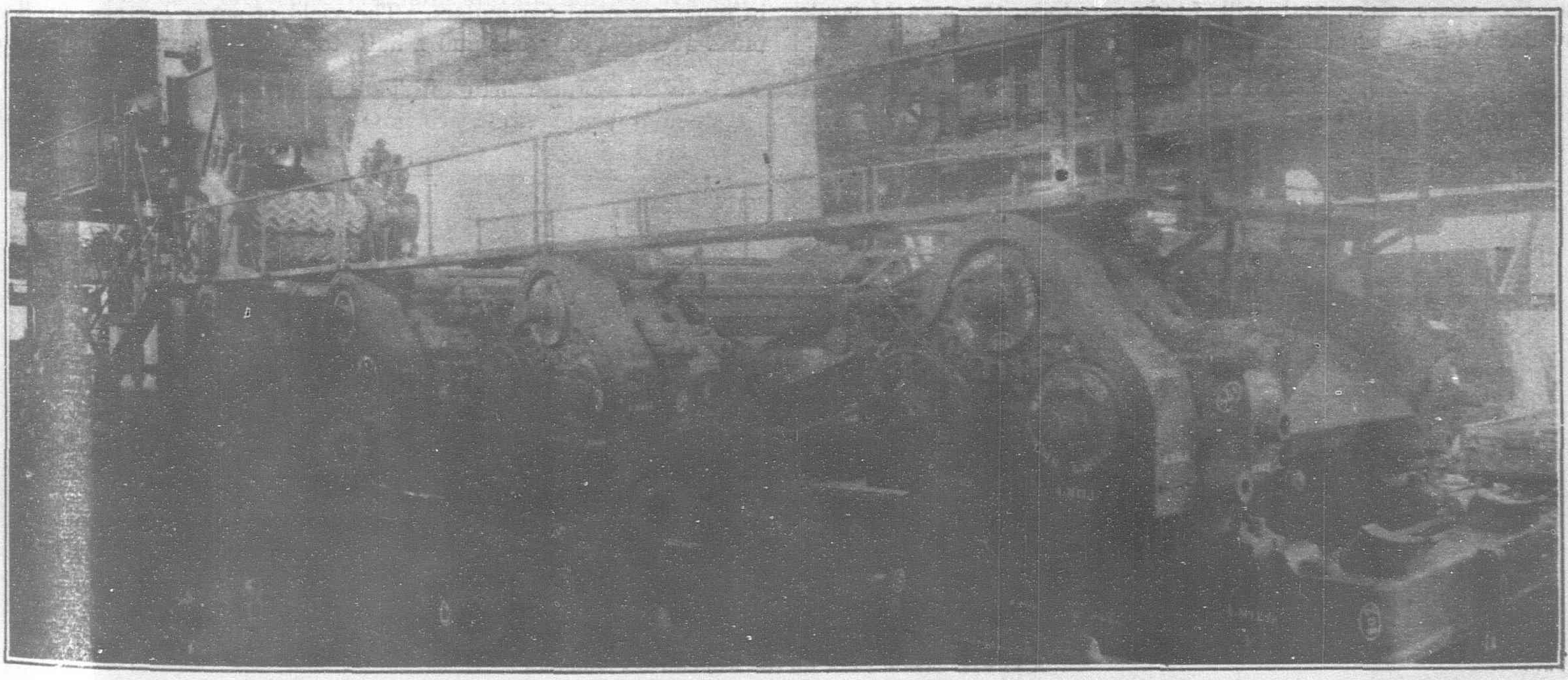


Boiler Room in the Ako Mill Showing Bagasse Feed to Boilers and Excess Fuel Shutes

The regulations had the effect of quadrupling the plantings in only three years.

All the new mills were erected without any subsidy or assistance from the government, and as the sugar bureau had justified its existence and attained its objects, it turned its attention to the encouragement of the planting of a better class of cane.

The native species of cane had so deteriorated in sugar content that it required little effort on the part of the authorities to encourage the cultivation of the better plants, the seed for which was imported from Hawaii, Java and Australia. Together with the improvement of the cane, irrigation projects were carried out and steam plows imported. On the Kohekirin estate several sets of Fowler steam plows worked by cable were placed in operation obtaining the same excellent results as followed the use of these



12 Roller Mill and Krajewski Crusher built by the Honolulu Iron Works for the Formosa Sugar Company

Formosa Sugar Company: Private Railway Bridge, 5,300 feet long over the Tamsui River

machines in Cuba and other large cane-producing countries. The rapid improvement of the cane species was followed by a considerable extension of area under cultivation. In 1908 there were 68,645 acres under cane, of which 28,055 were planted with native varieties and the remainder with improved and imported canes. By 1910, the area had increased to 162,108 acres and the yield per acre increased by 13 per cent. where formerly this had averaged only 8 per cent., with an improvement of nearly five per cent. in the amount of sugar extracted from the cane. The area under cultivation in 1917 was over 281,890 acres yielding over 700,000,000 pounds of sugar per year.

An official Japanese bulletin on the sugar industry issued at the beginning of last year, gives the number of modern mills in Formosa as 40, with an aggregate capacity of 30,000 tons of cane per day. The output was formerly confined to centrifugal sugar for the Japanese refineries, but white sugar is now being turned out at many of the larger mills and finds its way direct to the consuming market. The output of these mills, says the official bulletin, is often restricted because cane planting gives way to rice when prices for this latter commodity are high, and also because of weather disturbances.

This observation bears out the statement of Mr. George Fairchild of Manila, to the effect that the sugar crop of Formosa is incapable of much further expansion because of the demands upon the land for the more necessary life giving staple. This weight upon the expansion of the industry will grow heavier as the years pass and still further reduce the area of lands available for sugar cultivation.

A Formosan Cane Field

So far as can be ascertained practically all the available sugar cane districts in south Formosa have been allotted under the sugar laws to various central factories. Outside of some 10,000 acres on the east coast of the island there is little land available for the further profitable expansion of the industry.

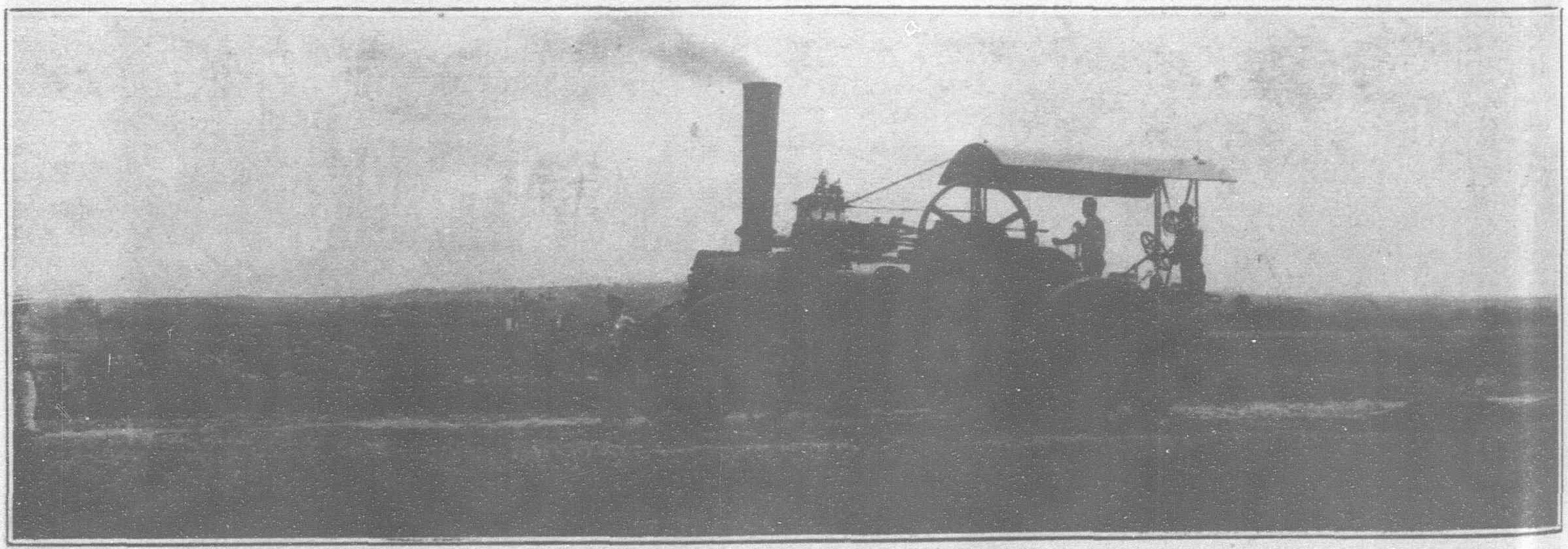
The official bulletin gives the following table showing the output of sugar in Japan proper and Formosa for the ten years ending 1919 :—

(In Thousands)

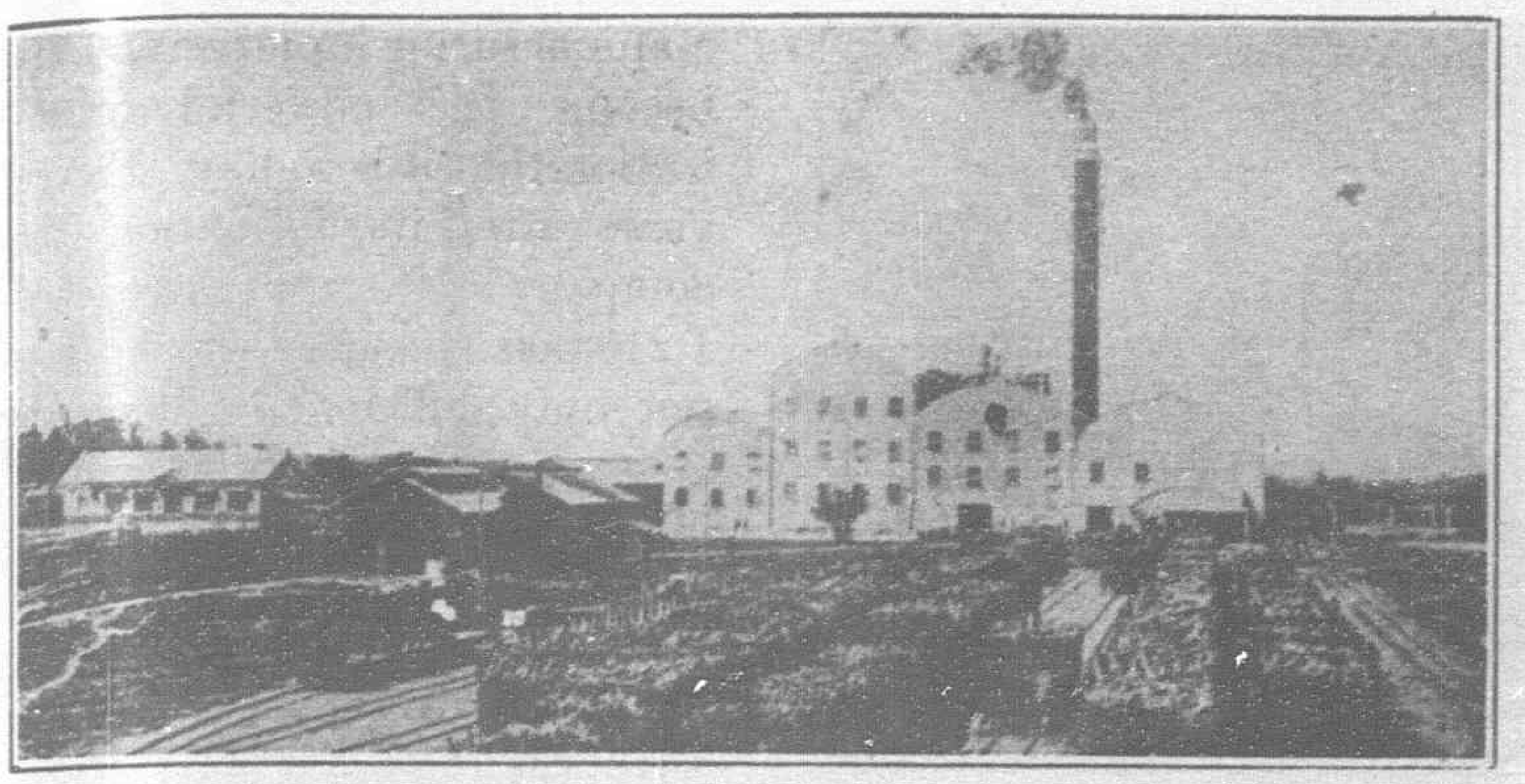
Year	In Jap. Proper.	In Jap.	Total.
	Pcls.	Pcls.	Pcls.
1910	1,051	3,404	4,403
1911	1,112	4,506	5,618
1912	1,121	2,926	4,047
1913	1,167	1,192	2,359
1914	1,451	2,513	3,964
Average for the above five years	1,180	2,908	4,028
1915	1,157	3,474	4,631
1916	1,601	5,351	6,952
1917	2,141	7,635	9,776
1918	1,421	5,735	7,156
Average for the above four years	1,580	5,549	7,129
1919	1,618	4,863	6,481

The last report of the Bank of Taiwan for the period ending June 30 ultimo, gives the output of sugar for the 1920-21 season at 4,000,000 piculs, an increase of 500,000 piculs over the preceding season, but owing to the decline in prices the loss on the crop amounted to Y.50,000,000.

Marked as has been the progress of sugar production in Formosa in recent years, it is still far behind the rate reached in Java in some essential particulars. The yield of sugar per acre in Formosa averages only one and a half tons, against an average of five



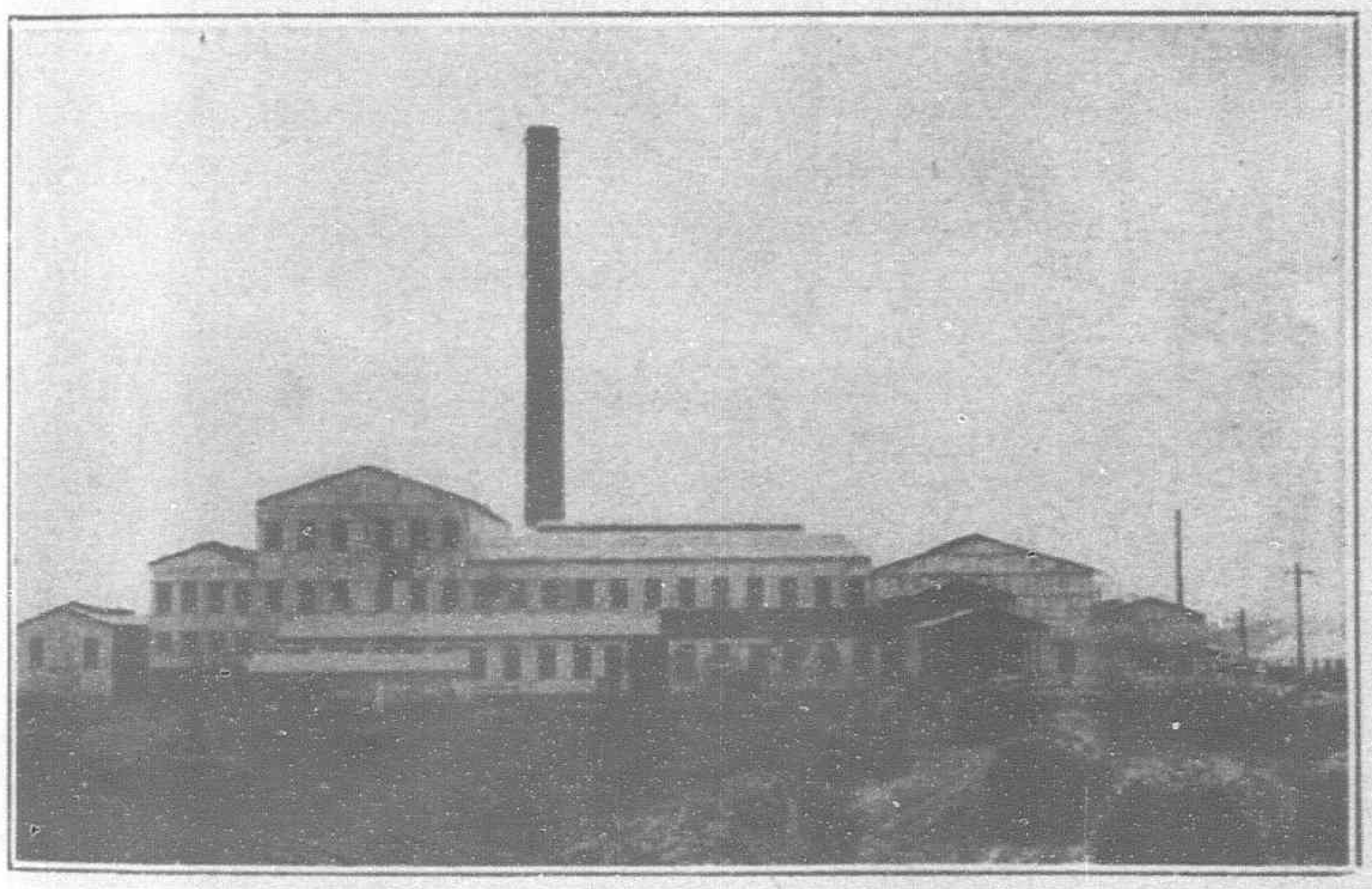
A Fowler Steam Plow on the Kohekirin Plantation



The No. 1 Mill of the Meiji Sugar Mfg. Co., Ltd. at Shorosho, Formosa

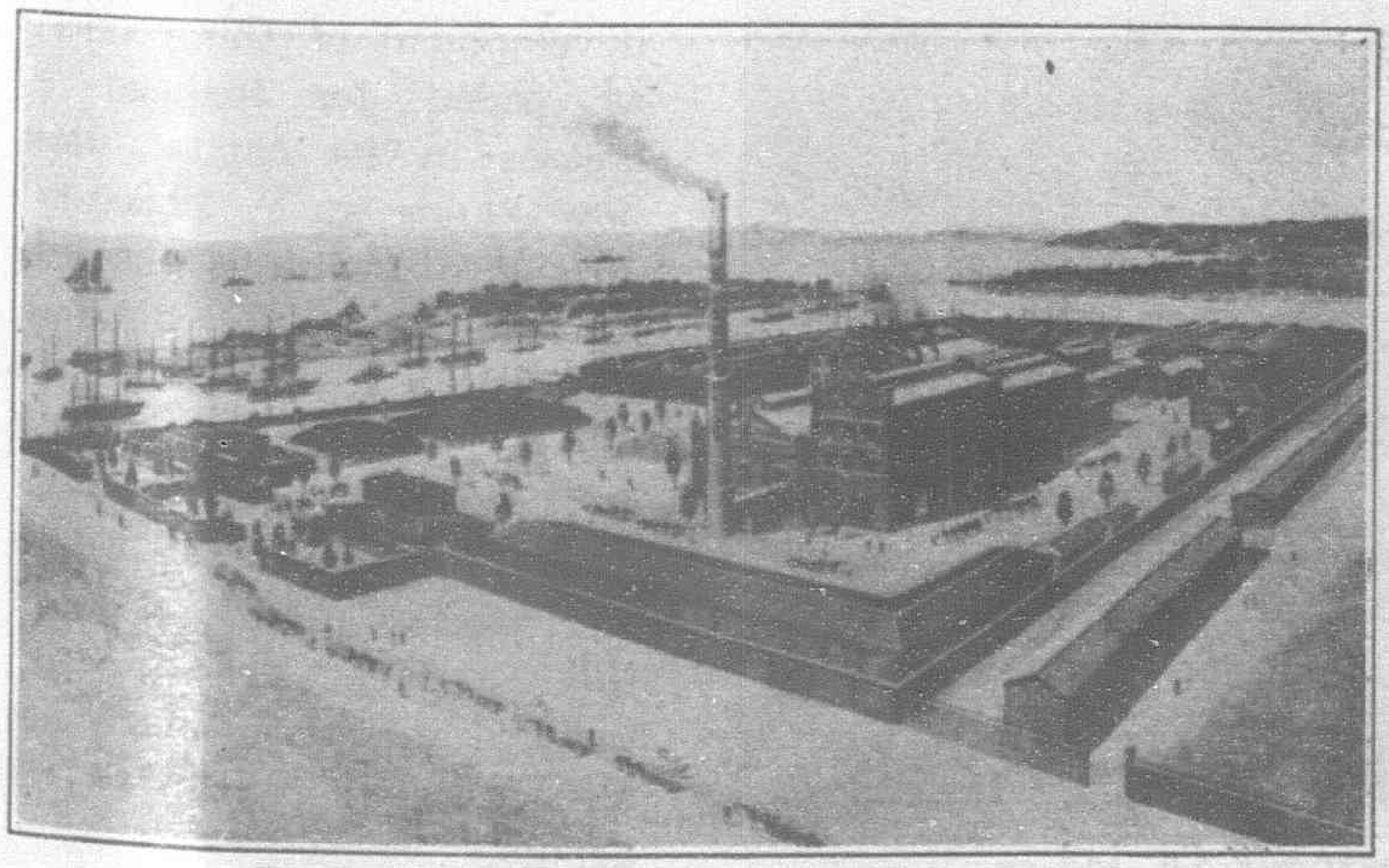
tons to the acre in Java and the Hawaiian Islands, a difference due largely to better irrigation and rotation of crops or permitting the land to lie fallow, whereas in Formosa the land is pushed to its limit of production and irrigation is inadequate. Wages in Java are also much lower, while Formosa enjoys a protective tariff of Y.3.10 per picul.

The equipment of the Formosan mills make up for many draw backs in other directions. The best machinery that can be procured has been installed irrespective of nationality of makers,



The Hokko Factory of the Oriental Sugar Mfg. Co. of Formosa

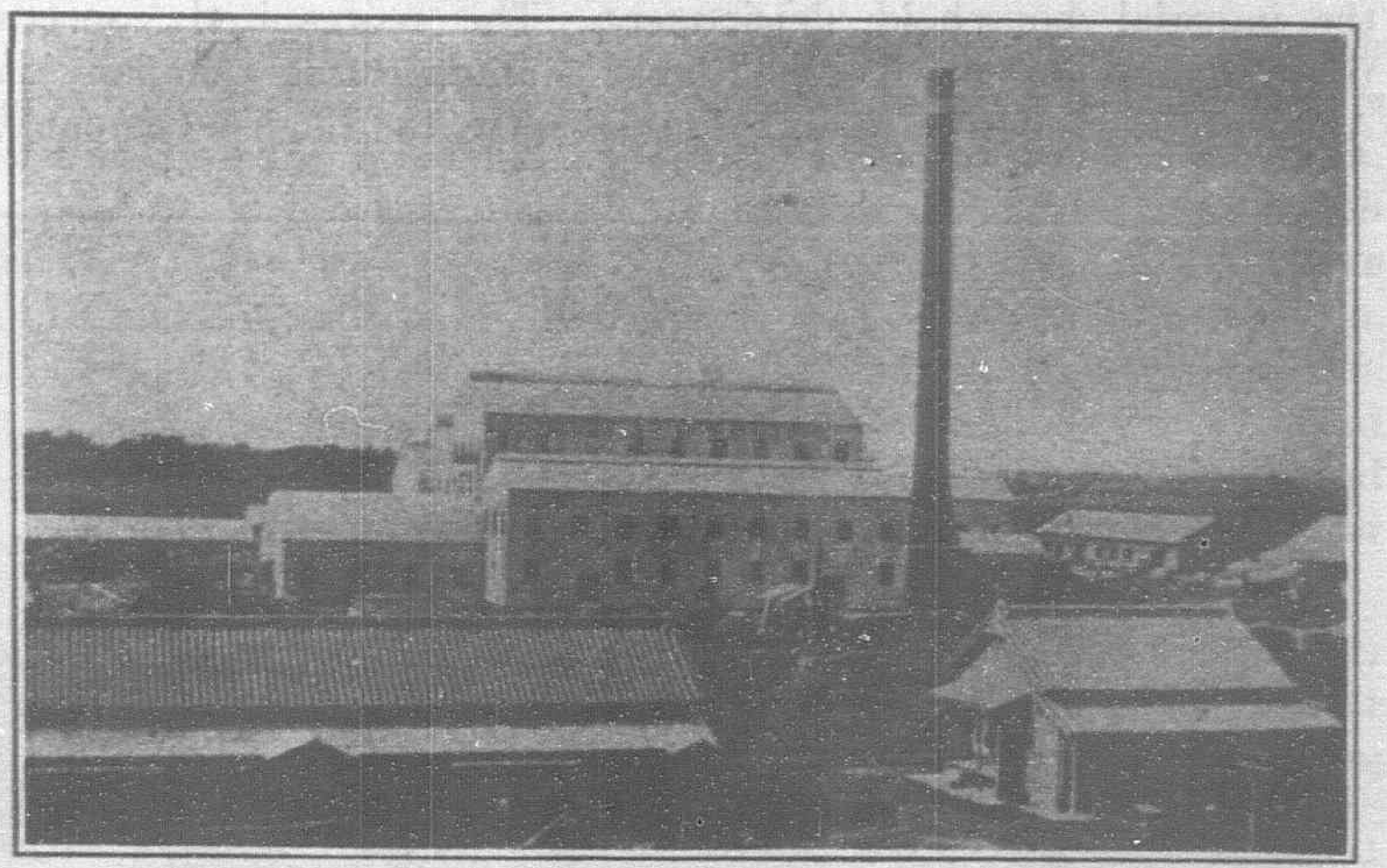
and, whereas the Honolulu Iron Works holds the record for the number of American mills erected there are many equally fine plants equipped with British machinery. The Harvey Engineering Company, one of the foremost manufacturers of sugar machinery in Great Britain have erected several mills and the Mirrless Watson Company, Ltd., have also some fine installations to their credit. All of the larger Formosan centrals are equipped with multiple mills and crushers, in which the maximum percentage of juice is extracted from the cane. The same excellence of equipment is found throughout all the various departments of defecation, clarification, filter presses, multiple effects, vacuum pans, crystallizers, centrifugals, cane loading and unloading devices, etc.



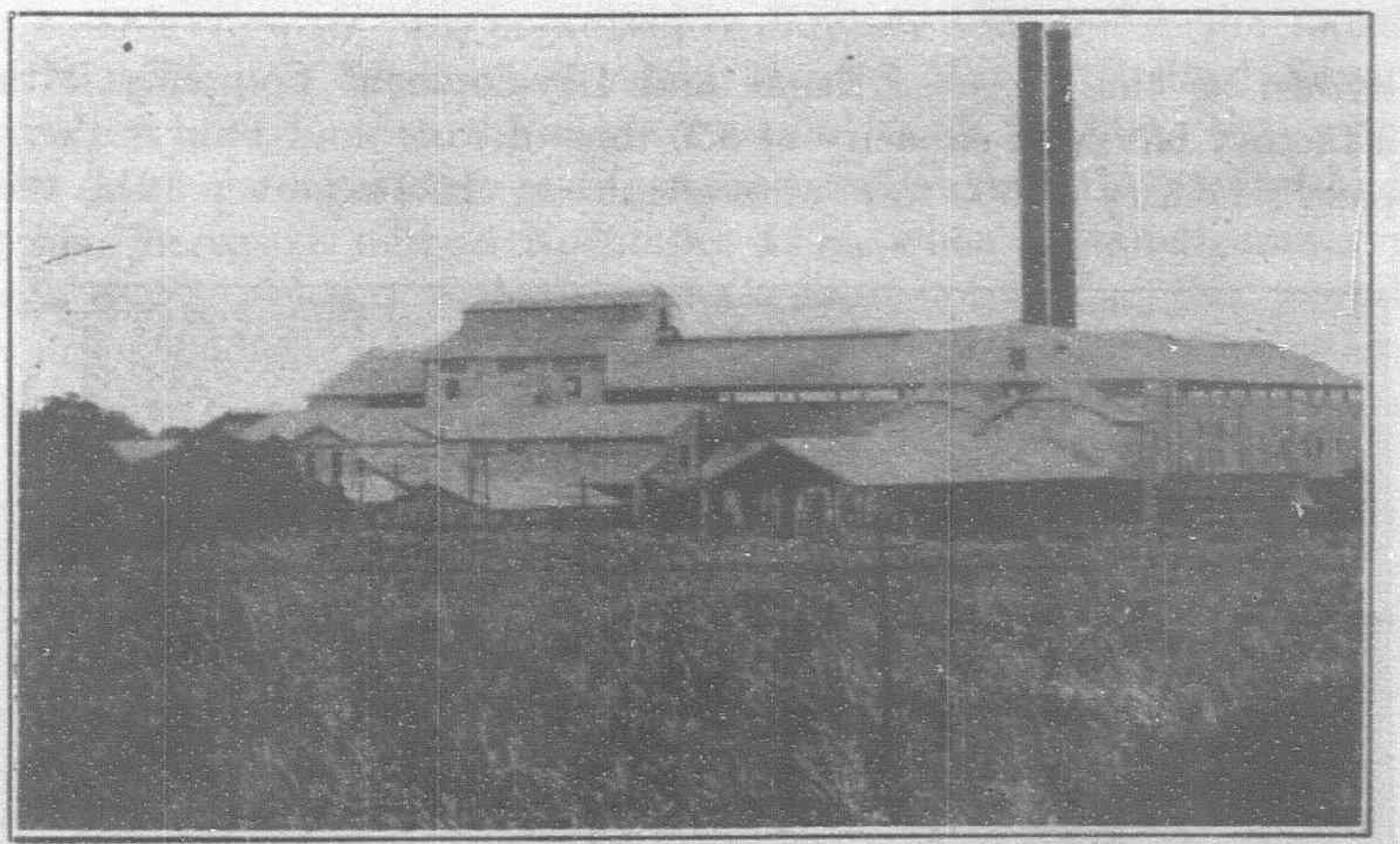
The Imperial Sugar Refinery at Kobe, Japan

Taiwan Sugar Manufacturing Company

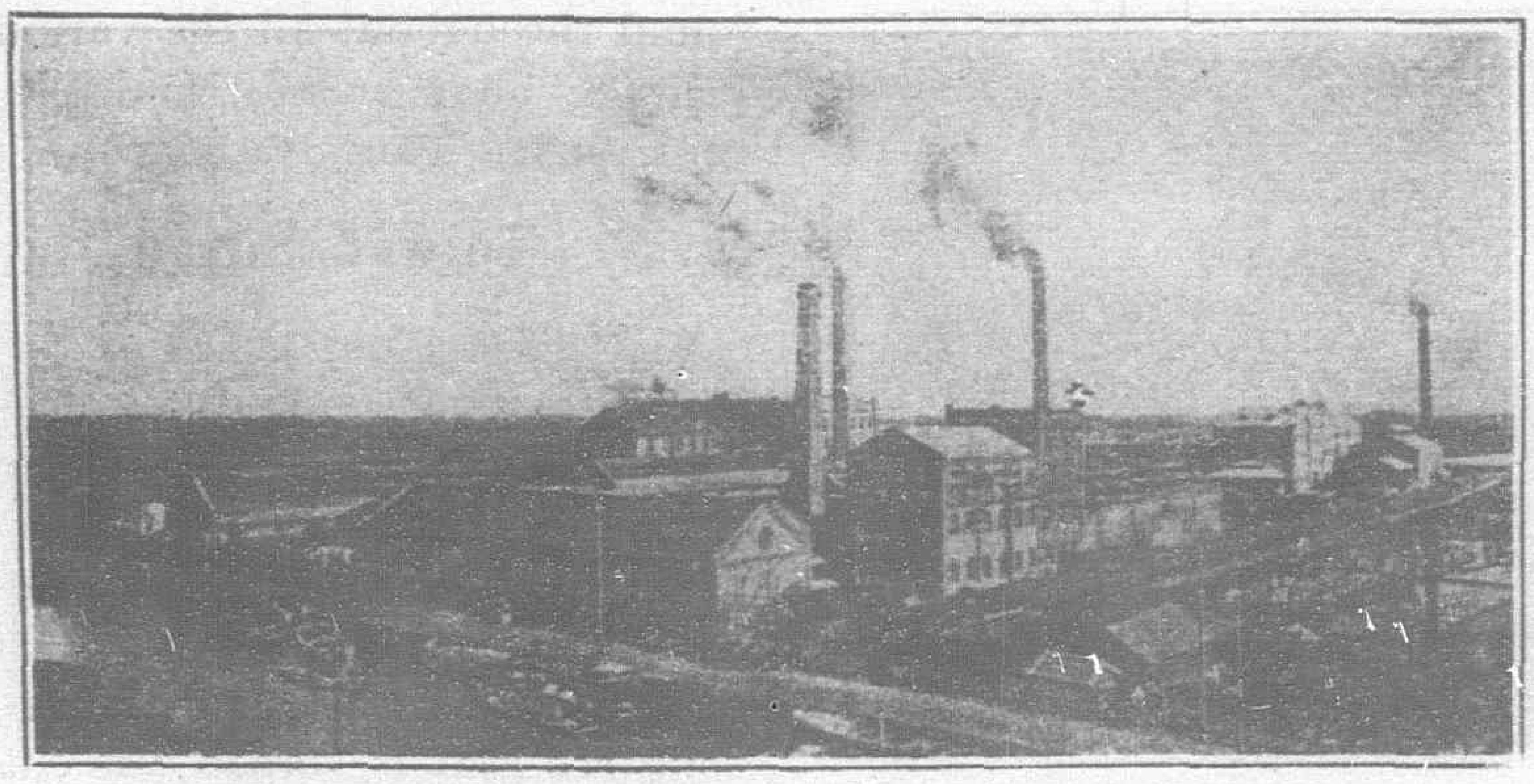
The most important of the Formosan sugar companies is the Taiwan Sugar Manufacturing Company, Ltd., more generally known throughout the Orient by its Japanese name of the Taiwan Seito Kabushiki Kaisha. This company was originally formed in December 1900, with a capital of Y.1,000,000, half paid up. The sugar market in Japan then offered every inducement for such an enterprise, as apart from the small output of some of the southern islands, Japan was entirely dependent upon foreign grown sugar. Formosa was an ideal sugar country and any Japanese company that could overcome the initial difficulties was certain of success. The president and manager of the newly created company went to Formosa to inspect and report on the adaptability for sugar cane cultivation of the fields in the provinces of Ako and Tainan. They decided to make a start with a small factory of about 250 tons of cane per day and purchase the cane from the farmers along the same lines as the central factories of Cuba and elsewhere, but this plan had to be abandoned as it was seen to be more profitable to purchase the land and cultivate the cane themselves. The new project was put before a meeting of the shareholders on January 5, 1901, and it was resolved to call up the balance of the capital (Y.500,000) and devote the money to the purchase of about 2,450 acres. This venture was not entirely successful owing to the poor selection of seed, the prevalence of fever amongst the laborers, and the exposure to attacks by aborigenes and bandits. A very difficult period was experienced before the production of cane and sugar became regularized. In August 1906 it was decided to



The No. 2 Mill of the Ensuiko Sugar Company, Formosa

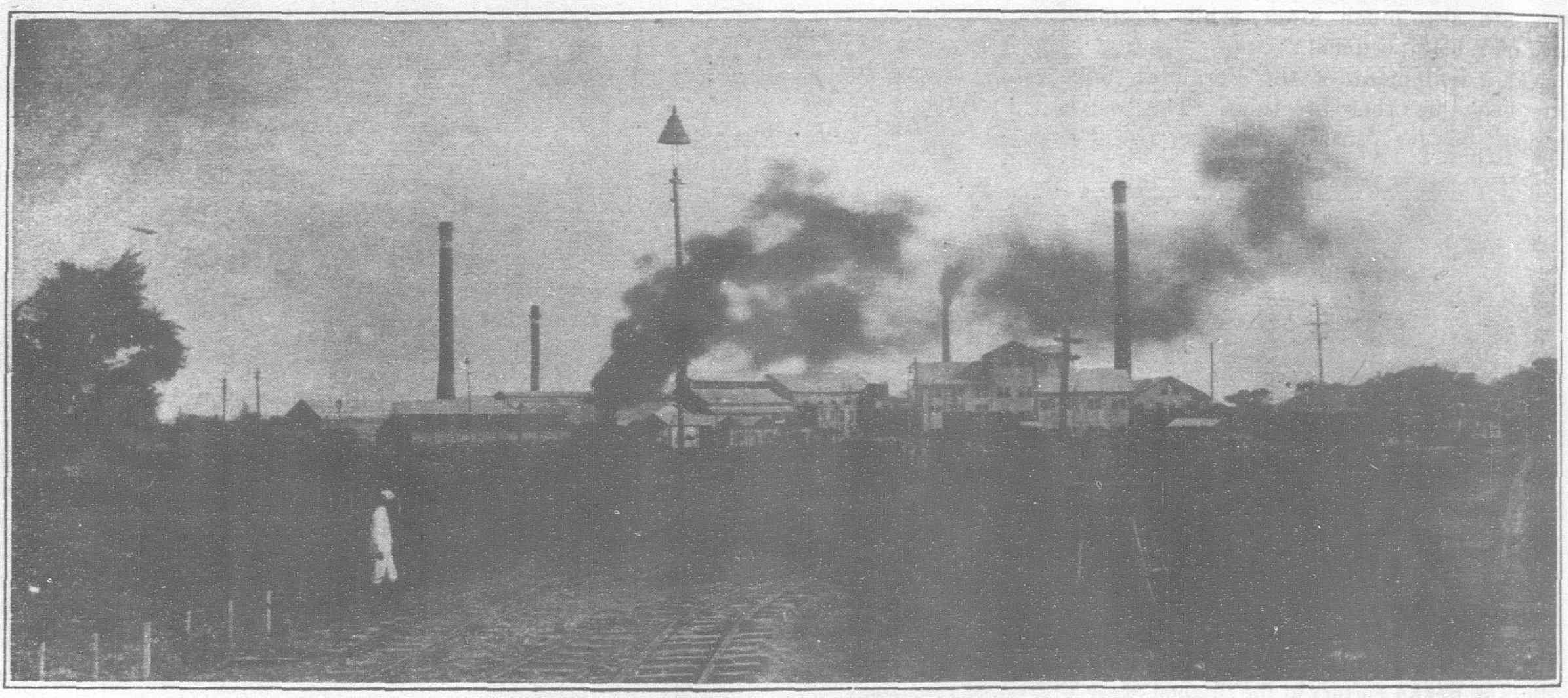


Nansei Factory of the Oriental Sugar Mfg. Co. of Formosa

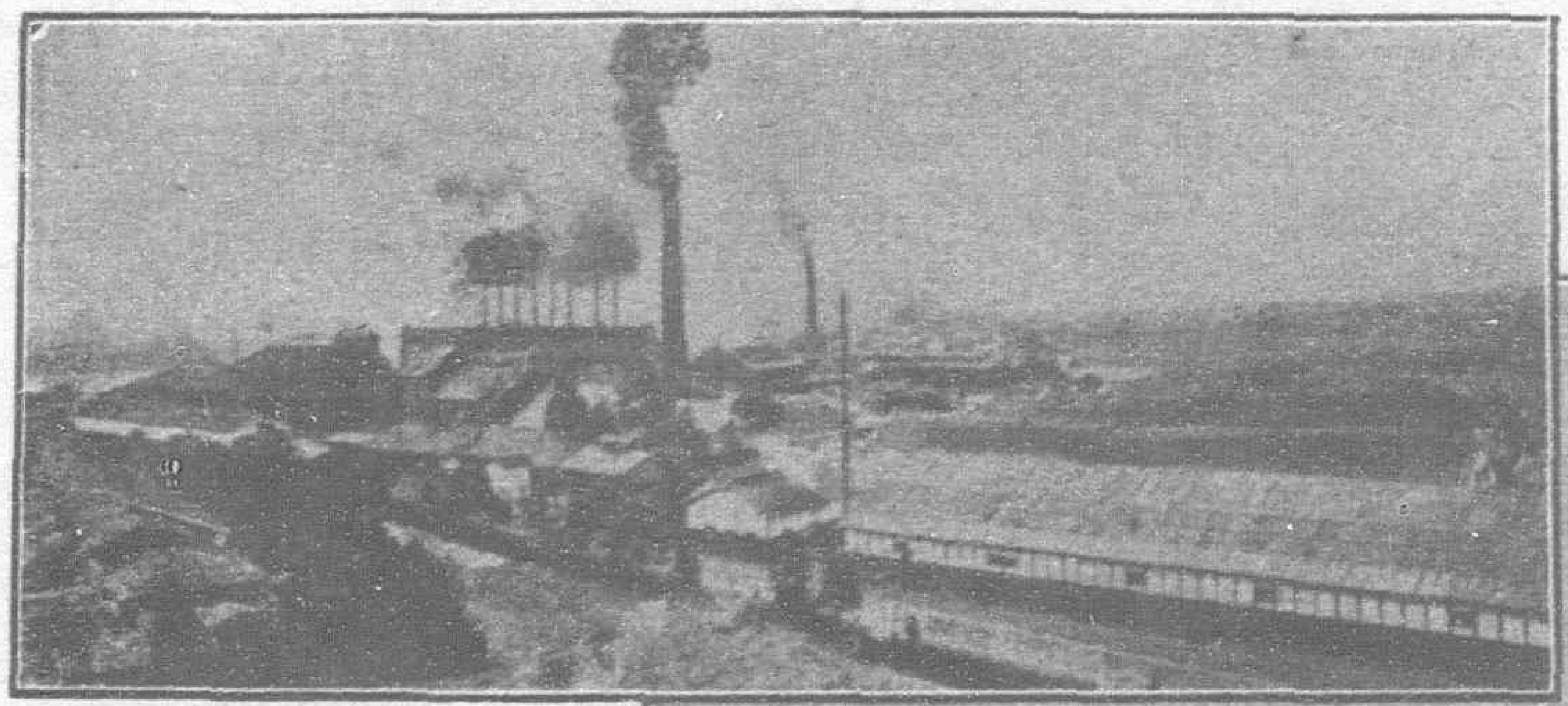


The Tokyo Refinery of the Japan Sugar Mfg. Co., Ltd.

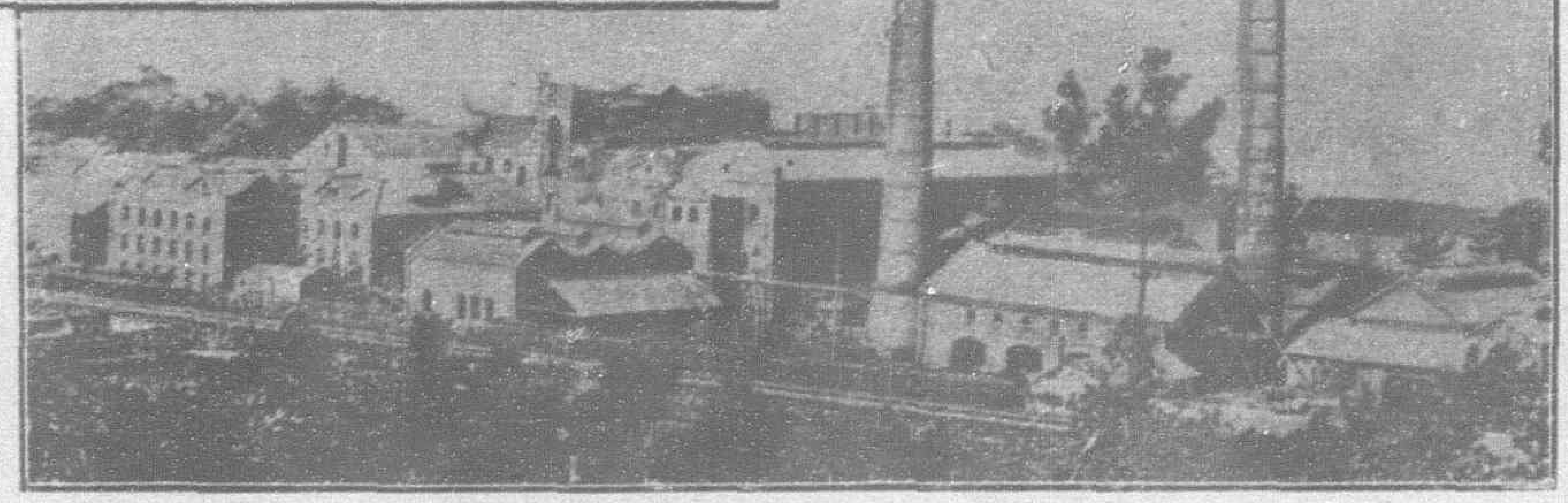
increase the capital to Y.5,000,000 and erect other factories. The success of this company soon attracted others into the field. The Daito Sugar Manufacturing Company was established at Ako, with a capital of Y.5,000,000, the majority of the shares being subscribed by the shareholders of the Taiwan Company. The amalgamation of the two companies took place in April 1908, and 9,000 shares of the joint stock of Y.100,000,000 taken up by the imperial household department. The reorganized concern then bought out the Taiwan Sugar Manufacturing Company in August of the following year. Subsequently, the English company, known as the Formosa Sugar and Development Company, with a factory having a capacity of 850 tons of cane, and Bain & Company's factory of 300 tons were acquired. In December 1911 the Kobe Sugar Manufacturing Company was absorbed at a cost of Y.950,000. By these purchases and amalgamations the Taiwan Sugar Manufacturing Company, Ltd., became the powerful organization that it is to-day. Eleven years after its formation the company's output reached 1,210,000 piculs, which was not only sufficient for domestic consumption but permitted export to other Far Eastern countries. In July 1914 the Horisha Sugar Manufacturing Company, and in September 1916 the Taihoku Sugar Company were amalgamated with the larger Taiwan Company.



The Kyoshita Mill of the Formosa Sugar Company

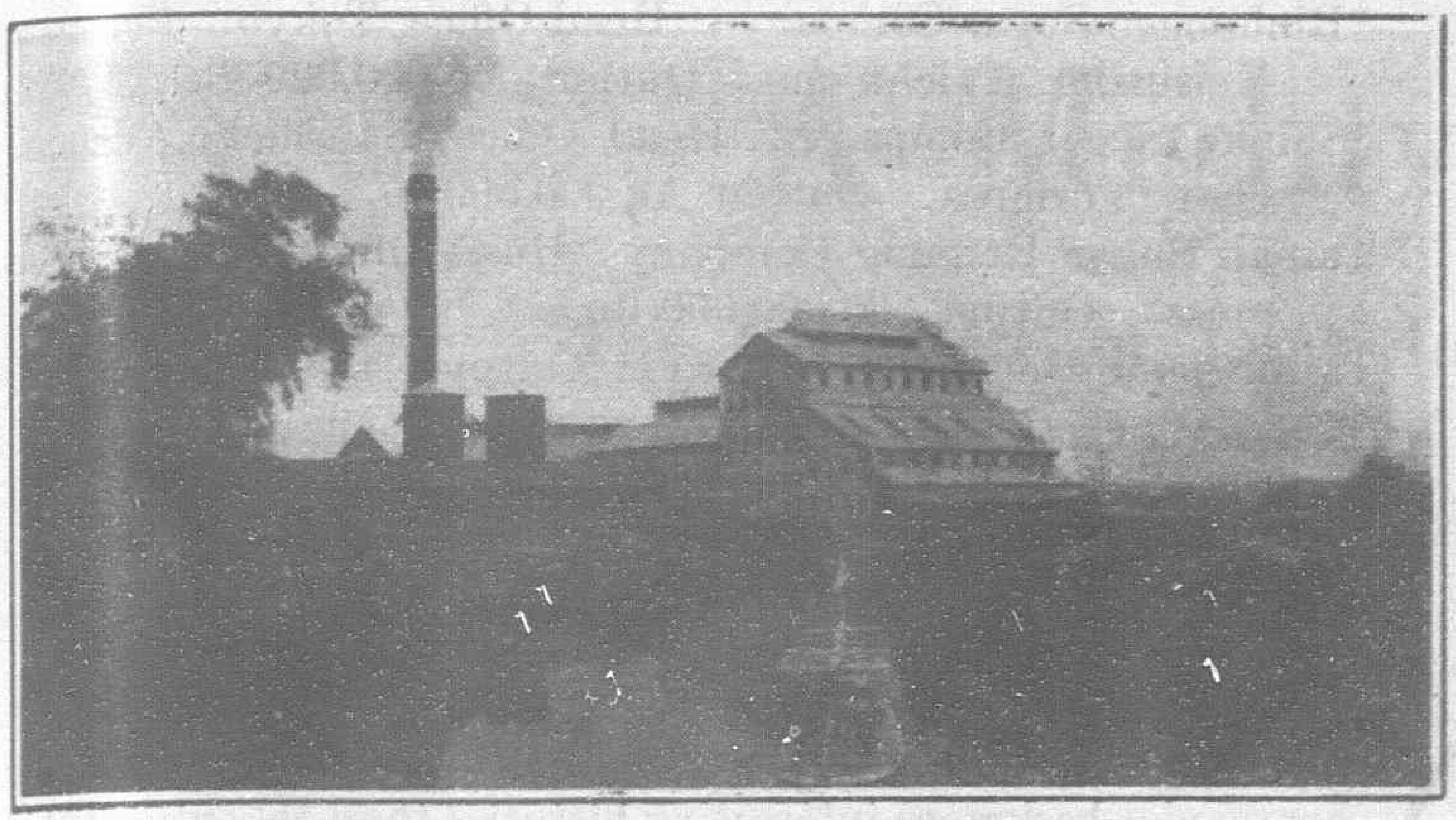


Osaka Refinery of the Japan Sugar Mfg. Co., Ltd.



The Dairi Refinery of the Japan Sugar Mfg. Co., Ltd.

To-day, the Taiwan Company owns and operates ten mills, eight in South Formosa, one in the centre of the island and one in the North. The mill at Ako is the largest, with a capacity of 3,500 tons of cane per day. In addition, there are two alcohol distilleries in southern Taiwan, and two refineries at Kobe. The total acreage under control of the company is over 36,500 acres. It has over 400 miles of private railways for cane transportation, with wharves, lighters and other minor plants. Of the 400,000 tons produced by twelve companies of Formosa, the Taiwan Company alone turns out over 120,000 tons, or about 30 per cent. of the total, and it produces about half the alcohol used in Japan. The development of this company as called for frequent increases in its capital, which now stands at Y. 29,800,000. Mr. Shiro Fujita is chairman of the board of directors, with Mr. T. Yamamoto as senior managing director and Mr. T. Takechi and Mr. T. Masuda as managing directors. The sale of the products of the company is in the hands of the Mitsui Bussan Kaisha as sole agents.



The Kobekirui Mill of the Formosa Sugar Co.

The Oriental (Toyo) Sugar Manufacturing Company

This company was established in 1907 with a capital of Y. 5,000,000 and at once began planting on an extensive scale, turning out 1,000 tons of sugar the first year and 2,000 tons the next. A year after its organization, the profits were Y.673,000 on an income of over Y.2,000,000. This company also started in to absorb its smaller neighbors and the Toroku Sugar Company was taken over in 1914, increasing the capital by Y.1,200,000, and several other smaller companies followed in 1915. The Hokko and Tamaki Sugar Companies were absorbed in 1916, bringing the total subscribed capital of the Oriental Company up to Y.11,750,000.

The Oriental Company has extensive plantations and large up-to-date mills. Its head office is at Nanseisho, Kagi prefecture, Formosa, with a Tokyo office in the Mitsubishi building. Mr. T. Shimosaka is president, with Messrs. Goro Matsukata, K. Komatsu, K. Fujita, S. Matsukata, R. Hyuga, R. Oka, S. Ishikawa and T. Tamura as directors.

Meiji Seito Kabushiki Kaisha

This company, more generally known as the Meiji Sugar Manufacturing Company, started its factory at Shoro in Formosa in December 1908, with a capacity of 750 tons of cane per day. The Santaw factory with a capacity of 1,000 tons was established in November 1910, and the Soya factory at Tainan with a capacity of 1,000 tons of cane per day in January 1912. At the same time, the company turned its attention to refining, and in January 1912 an amalgamation was effected with the Yokohama Sugar Refining Company and the capital increased to Y.10,000,000. Refining was begun at the Kawasaki Refinery, in Kanagawa prefecture, with an output of 200 tons of refined product per day. In July 1913 the Chuo Sugar Manufacturing Company with a plant at Nanto, Formosa, having a capacity of 750 tons of cane per day was absorbed, and the capital increased to Y.12,000,000. As the export trade began to assume large proportions which the Kawasaki Refinery was unable to meet, the Tobata Refinery was established in Fukuoka prefecture in July 1916 with a capacity of 100 tons of refined sugar per day. The maufacture of bye-products was entered into, and at the Santaw mill a large distillery was installed to make alcohol from the molasses. The Kawasaki Refinery is now equipped to turn out cube and powdered sugar. The capacity of the properties belonging to this company is over 3,500 tons of raw sugar per day, of refined sugar about 300 tons and 280,000 gallons of alcohol per year. The company is also considering the manufacture of confectionery and condensed milk. The president of the company is Mr. H. Soma with offices at No. 1 Yurako-cho Kojimachi-ku, Tokyo.

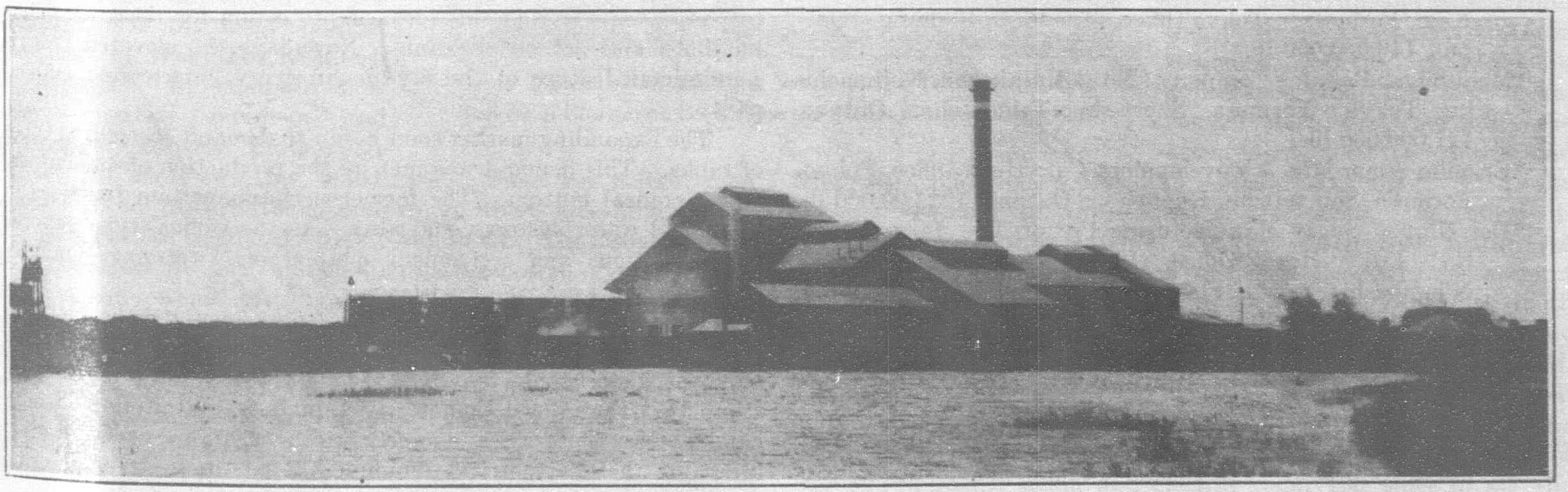
Imperial Sugar Company, Limited

The Imperial, or Teikoku Seito Kabushiki Kaisha, holds a prominent position in the sugar industry of Japan. The founders of this company Messrs. K. Abe, H. Yamashita and S. Matsukata, started in October 1910 with a capital of Y.5,000,000 which has since been increased to Y.15,000,000. It now operates five mills in Formosa situated as follows: Nos. 1 and 2, at Taichu; No. 3, at Tanshiken, Taichu; No. 4, at Suidensho, Shinchiku and No. 5, at Sankatutensho, Shinchiku. Alcohol distilleries are located at Taichu and Suidensho in the Shinchiku district. A large and well-equipped refinery is operated at Higashi-Shirike, Hyogo, near Kobe.

The total output of the five mills is over 2,500 tons of sugar per day. The company is engaged in all branches of the sugar industry and actively associated with the transportation business of the island where it operates the following railway mileage: 38 miles at the Taichu mill, 17 miles at the Shinchiku and two miles at Tanshiken, with an equipment of ten locomotives and nearly 600 freight cars. General passenger and goods traffic is handled over a distance of ten miles between Taichu and Mantoroku with a hand car service for another distance of 28 miles. They also operate their own fleet of steamers. The president and managing director of the company is Mr. S. Matsukata with head offices at No. 14 Taichu, Formosa, with a Tokyo branch at No. 1 Ginza, Shichome, Tokyo.

Japan Sugar Manufacturing Company, Limited

This company was organized in January 1896 under the name of the Nippon Seisito Kabushiki Kaisha (Japan Refined Sugar Company, Ltd.) with the modest capital of Y.300,000, but with the opening of Formosa to sugar cane cultivation, the capital had to be increased, and in November 1906, when an amalgamation was made with the Japan Sugar Company of Osaka, the capital was raised to Y.12,000,000, and the present name adopted. In August of the following year, the Dairi Sugar Refinery was



The Sharoken Mill of the Taiwan Sugar Mfg Co.

purchased and gave the company its present premier position in Japan's sugar trade.

In 1908 the first mill was erected at Gokenseki, Kagi prefecture, Formosa, and a second mill in 1912. With the two refineries in Tokyo and those in Osaka and at Dairi, the company has a daily capacity of over 850 tons of refined sugar, in addition to the output of rock candy, alcohol in Tokyo and cube sugar in Osaka. The two mills in Formosa have a capacity of 2,200 tons of sugar per day drawing their cane supplies from an area of over 180,000 acres, of which, 6,000 acres are cane lands belonging to the company. More than 111 miles of railways are operated for the exclusive use of the company.

The present capital of the company stands at Y.18,000,000 with Mr. Raita Fujiyama (president of the Tokyo chamber of commerce) as president, and Messrs. N. Takayawa and R. Ito as managing directors. The head office of this company is at No. 12 Sanchome, Kakigara-cho, Nihonbashi-ku, Tokyo.

Dairi Sugar Refinery

The Dairi Sugar Refinery of the Japan Sugar Manufacturing Company is located within ten minutes tramway ride from the port of Moji and covers about 35,000 *tsubo* of land. The machinery is from the best American and British makers, the power plant being operated by two engines from Harvie & Company, with Babcock & Wilcox boilers, two General Electric generators and several motors. It gives employment to 250 laborers and an clerical force of 50. The annual output is over 1,300,000 piculs, of which the larger part is exported to China where the company has carefully studied the requirements of the market. The raw product is imported not only from Formosa, but from the Philippines, Java and Cuba. The South Seas, India, Russia and other parts of Asia are large purchasers of the refined products of this company, which are marketed through well-known Japanese firms, such as Mitsui Bussan Kaisha, Suzuki & Co., Yuasa & Co., Fukuwaya Co., Okura & Co. and Abe Companies. The general manager of the refinery is Mr. K. Akiyama.

The Ensuiko Sugar Manufacturing and Development Company

This company was established by Mr. Osetsuno in 1903 with a capital of Y.300,000. It was afterwards reorganized with a capital of Y.7,875,000. The company operates two mills with private railway system, turning out about 18,000,000-lb. of raw product per annum. Its head office is at Shinyei-cho, Kagi prefecture, Formosa, with a branch at Tokyo. President, I. Arai; Managing Directors, T. Maki and S. Fujisaki.

The names of the various companies operating mills in Formosa are as follows:

*Taiwan Sugar Refining Company, Ltd.: Head Office, 22 Honkokucho-Nihonbashi-ku, Tokyo. Formosa, Kyoshito-sho, Tainancho. Output, 219,970,000-lb.

*Oriental Sugar Manufacturing Co.: Head Office, Nanseisho, Kagi, Formosa. Tokyo Office, Mitsubishi Building. Output, 146,000,000-lb.

*Meiji Sugar Refining Company: No. 1 Yurakocho, Kojimachi-ku, Tokyo. Formosa, Shoro-sho, Tainan-cho. Output, 121,000,000-lb.

*Ensuiko Sugar Mfg. & Development Co.: Head Office, Tokyo. Formosa, Shinyei-cho, Kagi-cho. Output, 122,000,000-lb.

*Dai Nippon Sugar Manufacturing Co. or The Japan Sugar Co., Ltd.: Head Office, 12 Sanchome Kakigaracho, Nihonbashi, Tokyo. Formosa, Gokenseki-sho, Kagi-cho. Output, 91,000,000-lb.

*Taihoku Sugar Company (Imperial Sugar Co.): Head Office, 14 Taichu, Formosa. Tokyo Branch, 1 Ginza Shichome. Output, 82,000,000-lb.

*Niitaka Sugar Manufacturing Co.: Head Office, Tokyo. Formosa, Chikuishi, Churyo-sho, Taichui-cho. Output, 67,000,000-lb.

*Rinhongen Sugar Company: Head Office, Tokyo. Formosa, Keisu-sho, Taichu-cho. Output, 40,000,000-lb.

*Shinko Sugar Company: Head Office, Sanshicho, Tainan-cho. Formosa. Output, 14,000,000-lb.

Tainan Sugar Refining Company: Head Office, Tainan, Formosa. Output, 20,000,000-lb.

Taito Sugar Refining Company: Output, 4,000,000-lb.

Those marked with asterisk (*) operate plantation railways.

Romance in a Tank

NOWHERE in the world have long-established manufacturing companies had more interesting histories than those presented by certain American firms. The development of the iron and steel industry is a typically American story, and the histories of companies whose fortunes have been linked therewith reflect the commercial prowess characteristic of the greatest drama in the American industrial arena. A pioneer in this field was a Chicago builder of bridges and tanks. In 1865 steel tanks were already in limited use, but in that year this inventor produced a new type—with a self-supporting bottom—and organized a company to manufacture it.

Thereupon the Chicago Bridge & Iron Works began to revolutionize the elevated tank industry. The new principle of the hemispherical self-supporting bottom marked the invention as something much more important than a mere steel imitation of the ordinary wooden tank. This principle meant the elimination of the expensive grillage neceassary to support flat bottoms. It meant the reduction of cleaning and upkeep costs. It meant that danger from leakage and bursting practically ceased. In short, the erection in 1892 of the first elevated steel tank with a self-supporting bottom, marked a milestone in the history of modern engineering.

This invention was produced at a time of phenomenal industrial expansion. It was therefore assured a market which grew by leaps and bounds, at home and abroad, until to-day thousands of elevated steel tanks are seen in every quarter of the globe. The new industrialism drew increasing number of people into the cities, and the problems of sanitation and general water supply became acute. Modern sanitary engineering made increasing use of the elevated steel tank for municipal water storage. The problem of the protection of property—the fruit of all this commercial prosperity—from fire, became pressing. The timely invention of the automatic sprinkler system offered another use for steel tanks.

Against this tremendous tide of industrialism a new interest in human welfare was meanwhile making headway. A growing sympathy for the less fortunate classes of society—the public wards in asylums and poor-houses—and a recognition of their human rights, made the use of facilities for fire protection popular in public institutions. Many automatic sprinkler systems have been installed in response to this demand.

The growing regard for both life and property led many cities to pass laws requiring this form of protection for theatres, public buildings and industrial plants. Nowadays the elevated tank is a prominent feature of the sky-line in every enterprising municipality.

The expanding market soon began to demand specialized types of tanks. This demand was met by the production of an elliptical and a conical bottom. The former performs certain functions in municipal water systems, and also—like the conical type—affords an expeditious and convenient method of "watering" railway engines.

Thus the Chicago Bridge & Iron Works answered the challenge of a developing industrialism. The production of specialized types of elevated steel tanks may indeed be said to have in some measure stimulated that development. Certain it is that to-day in both hemispheres there rises against the horizon an ever-spreading forest of these symetrical monuments to American engineering genius.

A Mighty Enterprise

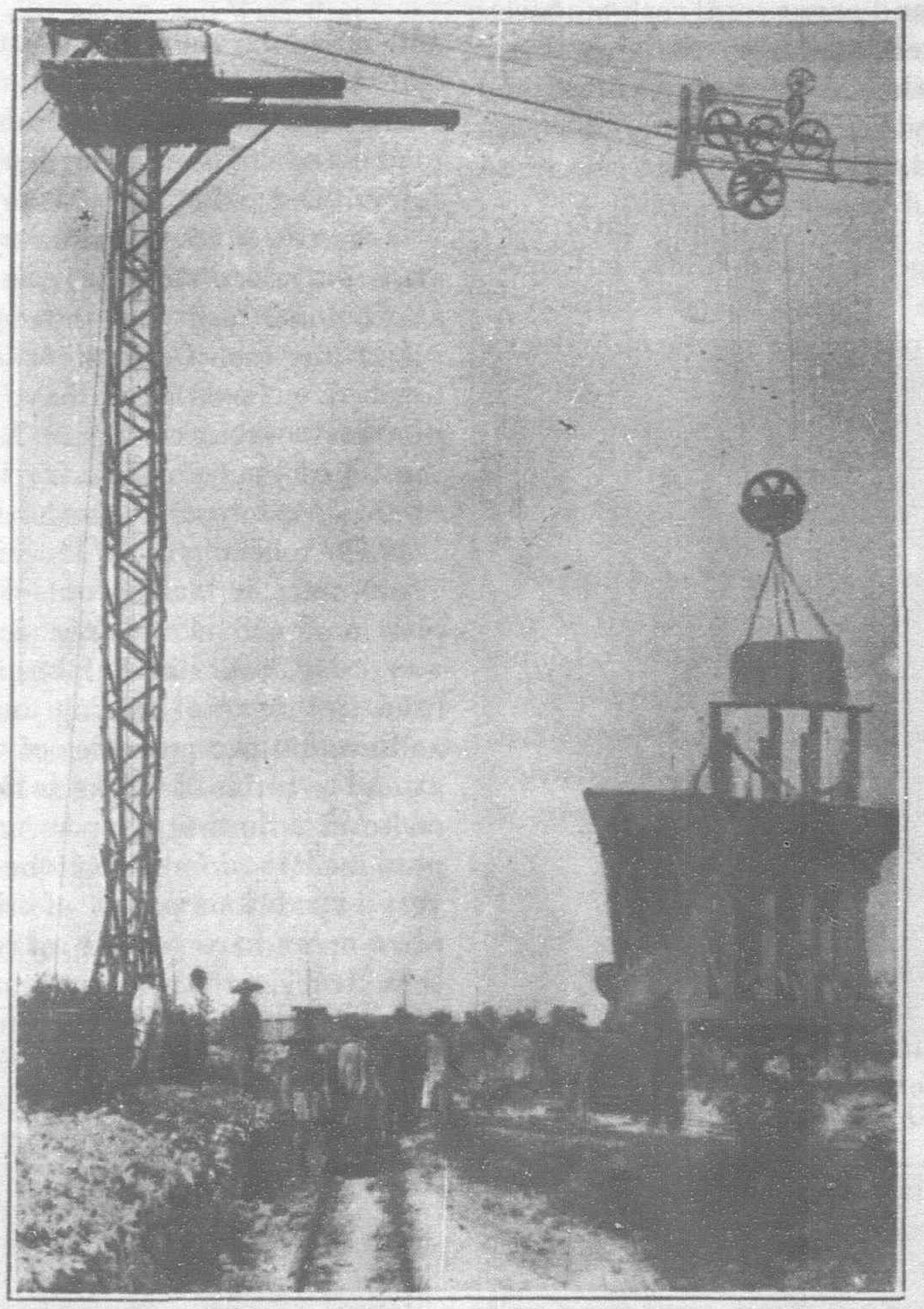
The Phosphate of Lime Industries of the Central Pacific
The Amazing Story of Ocean and Nauru Islands

Written and illustrated by Thos. H. McMahon, F.R.G.S.

THERE is no exaggeration in the opinion that in the history of enterprise there is to be found no more impressive demonstration of pluck and endeavor that in the truly up-to-date wonderful and interesting phosphate-of-lime industries of Ocean and Nauru Islands, of the Central Pacific. Ocean Island is but 1,000 acres in extent and Nauru 5,000 acres, both islands lie in Latitude 0 degrees 52 minutes S. and longitude 169 degrees 35 minutes E. both are within 50 miles of the equator and are 160 miles apart. These islands—the first British and under British administration, the second formerly German but now under mandate given to the British empire and governed by Australia, are nature's store houses of a very high-grade phosphate of lime, a magic plant food and general fertiliser.

By the magnitude of its operations this enterprise has given a significant value and importance to the Central Pacific, a little-heeded, little-known part of the globe.

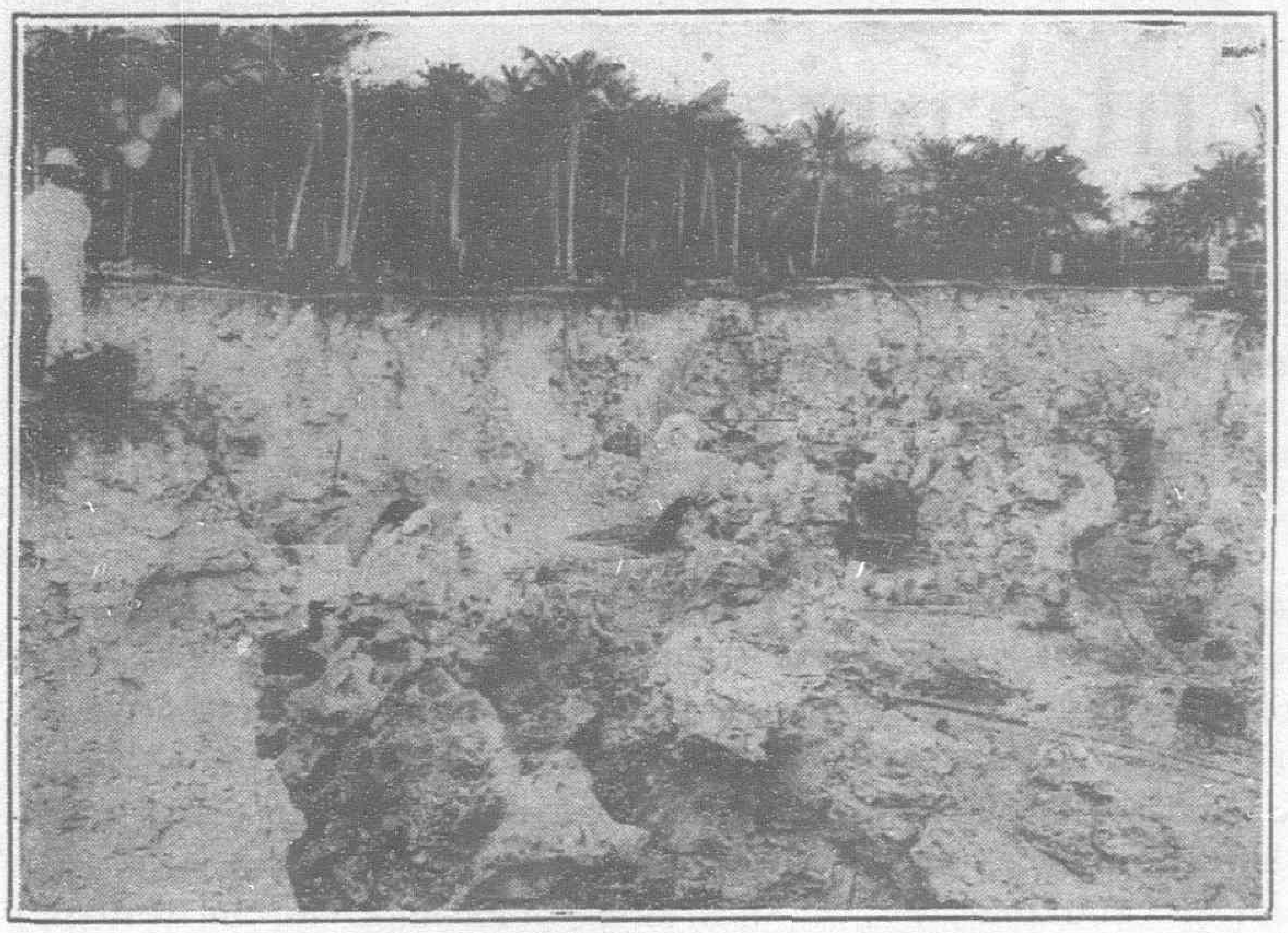
A thousand people, white, yellow and brown are engaged in this industry and increasing trade will soon necessitate the employment of many hundreds of extra hands. The greater number of white employees are British, Scotch and Irish, but there are also many Americans and Australians. There are some three hundred of Gilbert Island natives, some three hundred Chinese at Nauru, these supplemented by hundreds of natives from the Marshalls, and the Carolines groups and a small number of Nauru islanders.



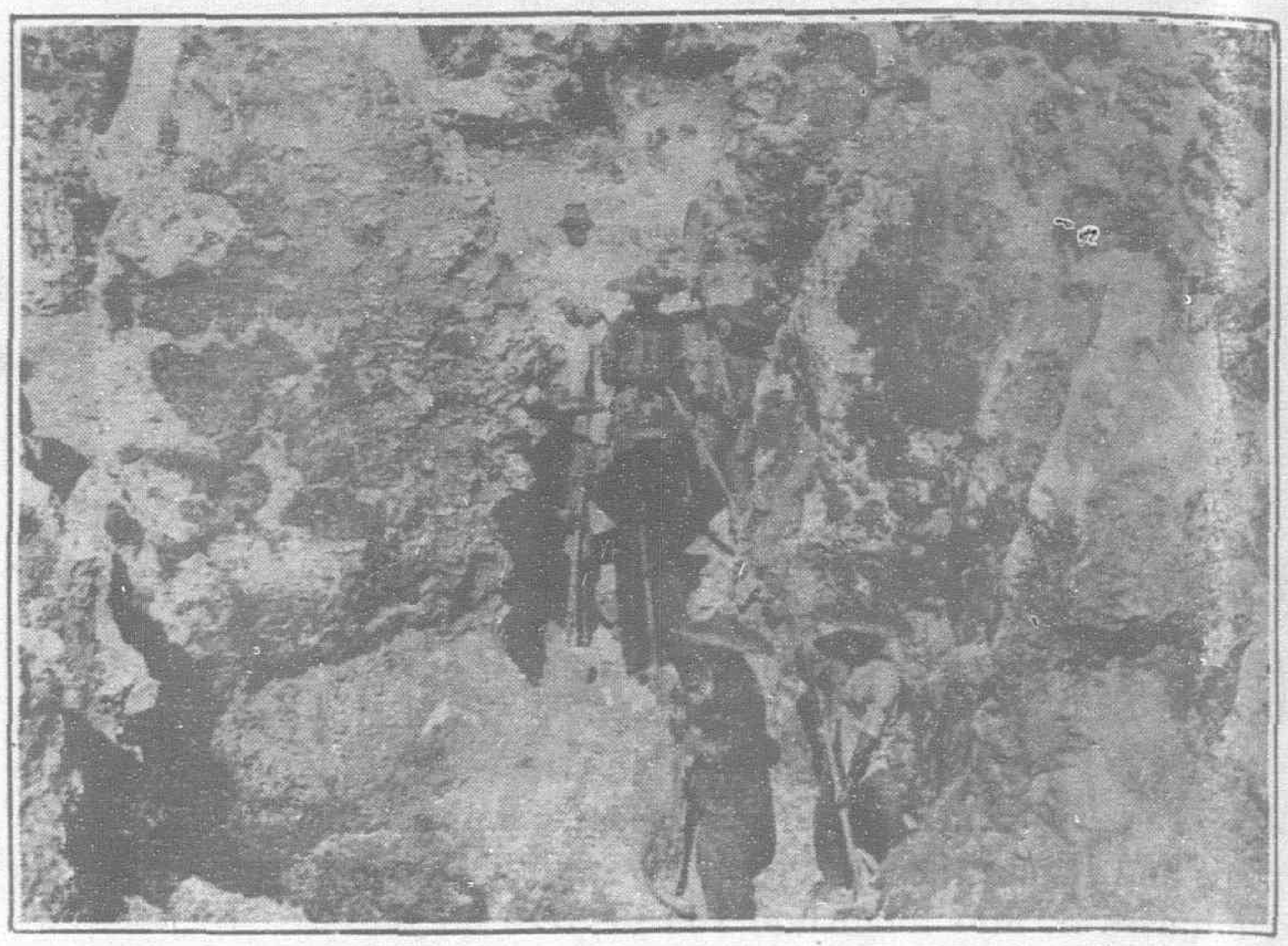
Cable Transmission used on Nauru Island for Transporting Baskets of Phosphate Rock from the Fields to the Railway Cars

The bounteousness and wonders of nature are shown in the composition of this magic product phosphate of lime. For years—it is impossible to compute how many—countless numbers and generations of sea birds were attracted to these two tiny islands, where there was neither man nor animal to disturb them, and where there was that superabundance of fish usual to deep sea coral island. The birds subsisted to repletion on the fish, and created vast deposits of guana, rich in phosphate, which, mingling with the coral rock, rich in lime, and by the powerful process of nature, assisted by periodic and alternate droughts, copious rains, and occasional and complete submergings by the sea waters, were assimilated in one potent chemical factor—phosphate of lime, a buff colored rock, that contained the all-essential virtues of a prime fertiliser. To-day there is scarcely a bird to be seen on these islands, but there remain a rich treasure handed over to the use and ingenuity of men.

How many people will credit that in the silence, the vastness, of the little-known Central Pacific two modern towns have been upreared, two settlements of industrial activity having every convenience and comfort of civilized life and throbbing with the energies of a great modern enterprise! Day and night there are the crash and buzz of heavy machinery, the clangour and din of many workshops, the beats of steam hammers, the roar of furnaces from smithies and foundries, the shrill sirens of locomotives, the deafening rumble and rattle of phosphate-laden trucks rushing across overhead bridges or along busy railroads, bringing from the fields the precious phosphate rock to crushers, dryers and enormous storing bins, there to be ready for prompt distribution to the very ends of the earth. Striking features of the magnitude of the industry at both islands are the immense spider-like cantilever jetties fronting the settlement bestriding the reef, and breasting to the full the open sea, sometimes turbulent, and the sudden changes of winds making the loading of steamers under such conditions a work of great skill and some difficulty. This loading is also interesting, and, when a steamer is standing by, goes on night and day without a break. An endless circle of surf-boats with three shifts of men plies between the jetties and the steamer each carrying cane baskets capable of holding, per load, nearly three tons of phosphate. The boats pass under the end of the jetties, and from great shoots the phosphate is dropped into the baskets in a most expeditious manner. Thus laden, they are tugged off to the steamer by powerful launches, the baskets hauled up, and capsized into the holds of chartered 7,000-ton steamers. Natives, ghost-like in appearance from the fine cream colored dust that pervades the atmosphere, load the boats and trim the phosphate into the ships. At night, with the electric searchlights thrown over the scene, the effect is phantom-like in the extreme. A very distinctive feature of these industries is the deep-sea moorings necessary on account of the absence of natural harbors, and permitting of loading in all but the roughest weather. The moorings are remarkable, as they are the deepest, most extensive, and most costly in the world. The buoys, anchors, chains and cables are of gigantic size, designed and constructed for this unique system. It will be a surprise to the reader to learn that on these two tiny islands there is a network of well-laid railroads, steam and electric about 100 miles in all, the lines traversing the intensely picturesque phosphate fields, weirdly



A Phosphate Field at Nauru Island



Chinese at Work in a Nauru Island Phosphate Field. They are Prized Laborers

conspicuous in the form of spectre-like and gaunt coral rock pinnacle that obtrude in thousands in the worked out beds. Some of these pinnacles, church-steeple style, tower to heights of thirty to fifty feet. They are weathered to an extraordinary degree of sharpness, having tips so fine as to appear needle-pointed.

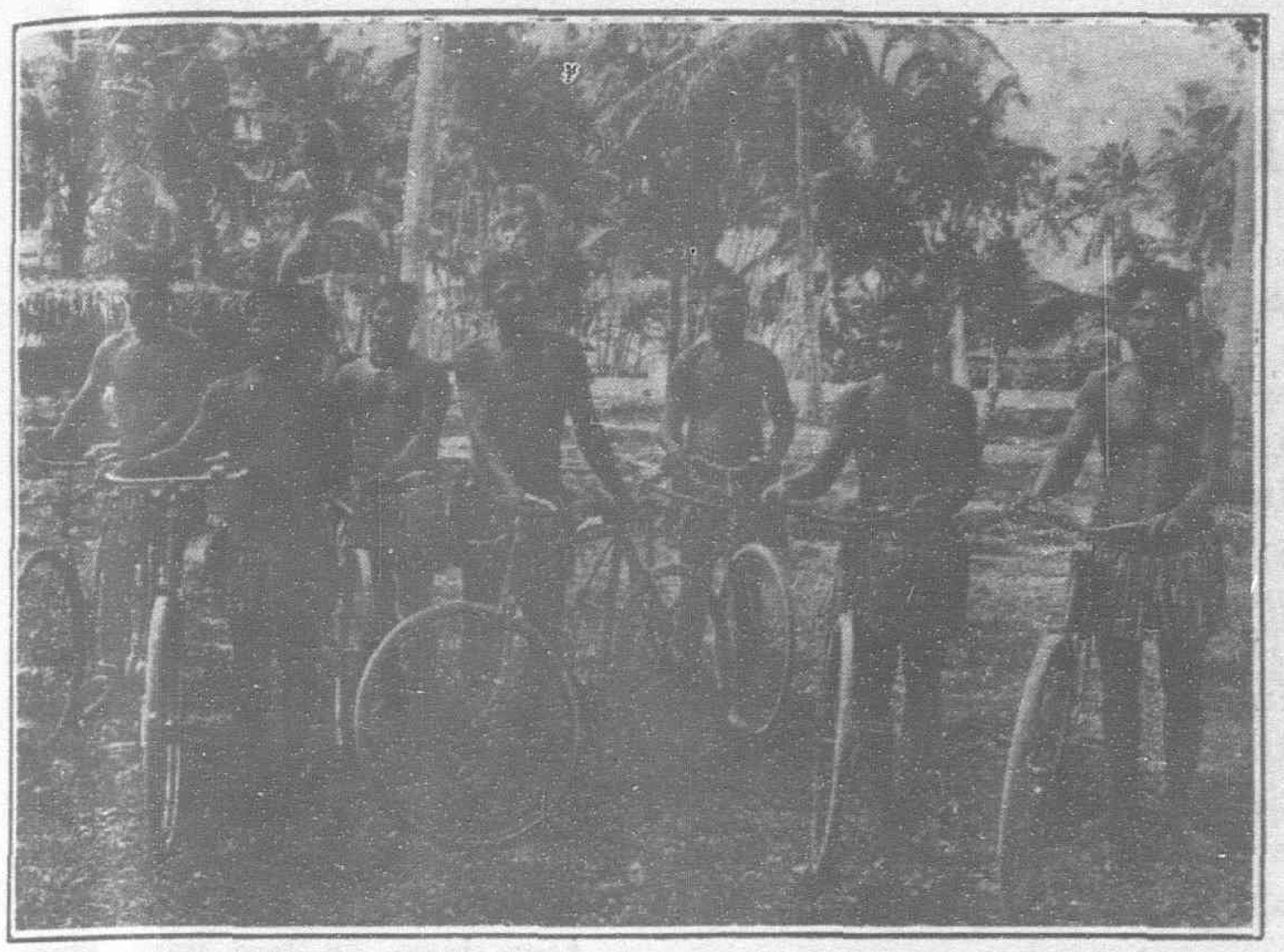
Quite a romance is attached to this phosphate of lime enterprise of the Central Pacific. Many years ago, a now defunct, but once justly famous, commercial concern, the " Pacific Island Company " had a small unpretentious office in one of the side streets of Sydney, New South Wales, Australia. A peculiar looking piece of rock served as a check to keep the office door open. It was tossed here, kicked there, examined curiously by some, but unheeded by most passers-by. A member of the Company's staff one day, who knew something of guano and phosphate rock, took it up, examined it, and subjected it to a chemical test, and as a result of an investigation was set afoot to trade the origin of the insignificant bit of buff-colored rock. A sailor had picked it up on Ocean Island thinking " what a fine stone it would be for making marbles for schoolboys." It proved, however, to be the key to a rich storehouse of nature and to treasure islands in the Pacific. Experts visited the island, and it was quickly realized what possibilities were in phosphate-of-lime as a fertiliser. These possibilities were worthy of a great commercial undertaking, and the first offer to work the phosphate field was made to Australian capitalists who turned it down as having no commercial value. The venture, however, was very eagerly seized by a financial British Company. The setting up of an industry on Ocean Island was an undertaking with heavy expenditure, attended by all the disabilities of inexperience, and made more difficult by the extreme remoteness of the island. But the years of rick passed, the enterprise prospered, and the great fertiliser dug and blasted from the coral rock has gone and is going to the ends of the earth, revitalizing over-used and impoverished agriculturaf lands.

Shortly after the industry at Ocean Island was set in motion, attention was directed to the island of Nauru, adjacent and found also holding large deposits of high-class phosphate of lime. The island was then German-owned, and its valuable product was untouched. Nauru would have remained a waste but for the exploration and overtures of the British Company. British persistency succeeded, and an industry began on the island under terms and conditions agreeable to the German government.

The phosphate of lime is of two classes—rock and alluvial. The former is blasted out, while the latter can be removed with pick and shovel. Every detail is carried out in a systematic way. No sooner is the phosphate rock loosened than it is removed from the scene of mining and tossed into railway trucks running and around the pinnacles of the worked out areas. Gangs of men attend to trains of trucks as the stuff is loaded, and these are pushed on to distributing hoppers, great wooden towers which stand out prominently, dominating the fields. From the hoppers it is by a very expeditious patent of trap-doors dropped on to trucks, which come up and are pushed away and filled with remarkable celerity; these trucks are then sent from the hills down steep declines on the plan of loaded trucks descending as empty trucks ascend. Once on the main lines, at the junction of the declines, small but important looking, puffing railway engines make fast to long trains of the

The Loading Wharf at Nauru Island

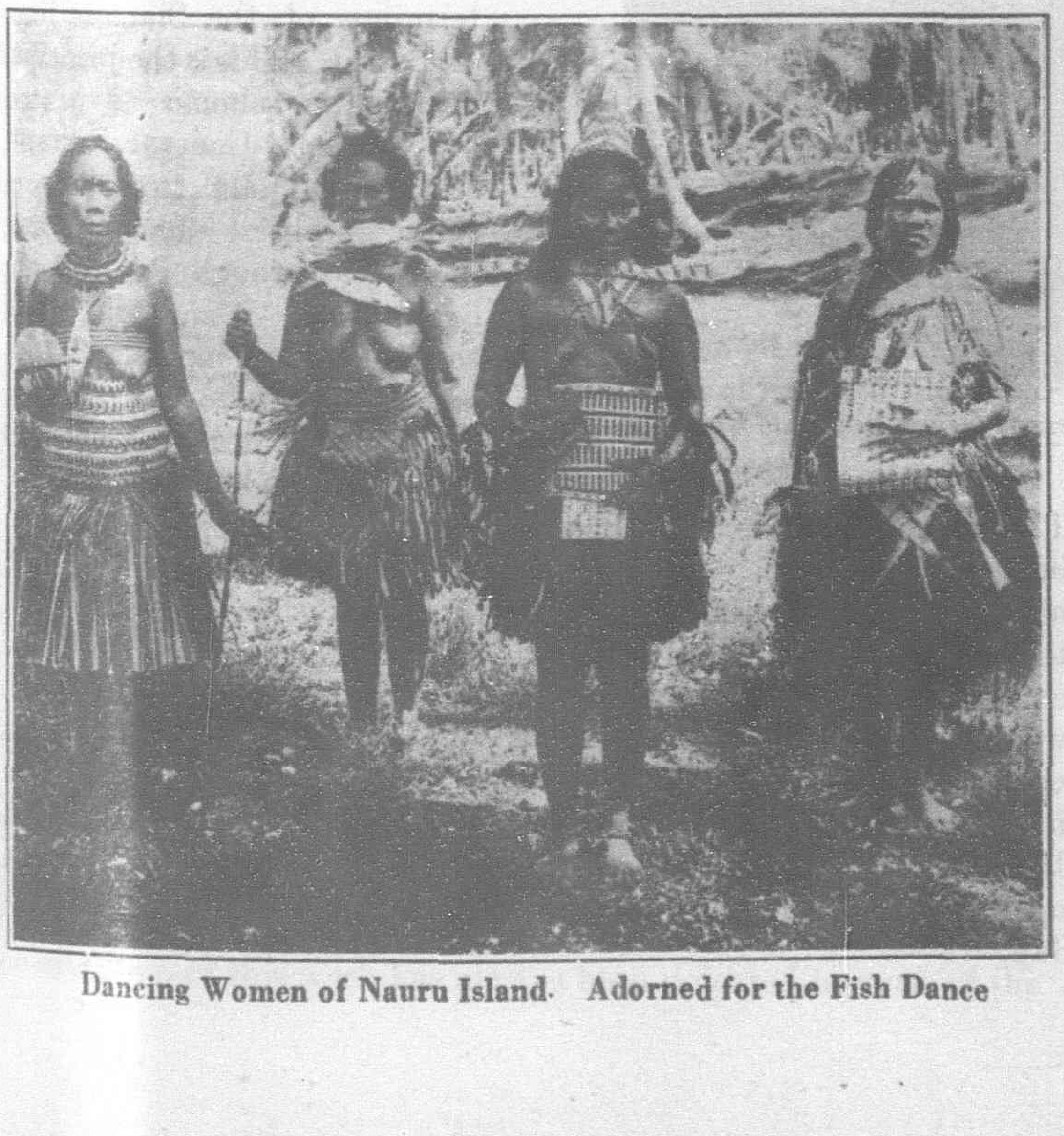
Loading the Dump Cars with Phosphate Rock



The Natives of Nauru Island are a Handsome Race. Every Man and Boy Owns a Bicycle and are Expert Riders. The Nauruans are Famous for their Politeness, a Native Cyclist will Never Pass a White Person while on a Bicycle, but will get off and Walk Past and Bow Ringing the Bikebell all the Time

loaded trucks, which have been shunted into place by a number of natives; and these trains are then backed into the great buildings where the dryers and crushers are at work. The phosphate rock is dumped into wet hoppers, and passed from them to the great crushers, where it is broken up into a size suitable for drying and shipping. From the crushers the phosphate passes into the dryers, revolving cylinders in which the phosphate comes in contact with hot air. All moisture is thus evaporated. After leaving the dryers, the phosphate is taken by elevators and conveyers and distributed to the storage bins, capable on both islands of holding many thousands of tons. Another expeditious and useful patent is attached to these bins in long rows of trap-doors or opening valves, which fill up trucks by the mere pulling of a lever. The trucks are then shunted on to the jetties, and the phosphate passed through the jetty shoots into the surf boats below, as told before, and thence on to the steamers. To prevent stoppage of work in wet weather great areas roofed with galvanized iron are set apart, and here the workers can blast, dig and truck without discomfort of any kind.

The industries stand unparalleled in the tropic world, for the care, attention to, and comfort of the employees. A complete and successful domestic management ensures modern conveniences and comfort to the workers, irrespective of status or color and free of all charges. The health and entertainment of all are assured by well-planned system of sewerages, fresh and salt water in unstinted abundance, electric light, fresh food supplies, refrigerators and telephones connecting every office, work-shop and house. Every nook and corner of the settlements is lit up at night, giving the impression, when viewed from a few miles out at sea, of an approach to great towns. There is a free daily distribution of ice, with weekly distrbutions of useful household comforts, such as soap, cordials, etc., privileges perhaps unequailed in any industry in the British empire. The employees—white, yellow and black have free houses, free messes, free public laundries. Married men are allowed free houses and extra allowance for living. There are excellent free recreation and reading rooms, sports and tennis grounds, the company supplying reading matter and the implements for recreation and sport in billiard tables, tennis and cricket balls. There are free hospitals replete with operating rooms, dispensaries, furniture and conducted so well as to be without compare in the Pacific Islands. There are American doctors, one on each island, Australian matrons, and native orderlies, medical attention and medicines being free. There is a fish market and the natives of the islands are encouraged to bring in big supplies of fish daily, to be passed on to the various messes, the married people generally employing their own individual fisherman, who for 10s. a month provided any quantity. Asiatic and native laborers are well housed, fed paid, guarded in health, and worked under comfortable conditions, and wise methods as to time and weather.



Dancing Women of Nauru Island. Adorned for the Fish Dance

The Chinese of Nauru have their tea houses and places of amusement, and though they come under a limited time of engagement since the war, they are so contented that each one signs on repeatedly for a further period of employment. The native workers have commodious dormitories and messes if single. The married men live in electric-lit, tiled-roofed, well finished, cool homes, and they have their dancing grounds for any festivity or rendezvous. On both islands are elegant, and complete stages for open-air entertainments, where high-class concerts and theatrical performances frequently take place to the benefit of patriotic funds, which have received some thousands of pounds. Although within touch of the equator, these islands are remarkably cool and salubrious in climate. The health of the communities has never suffered any epidemics and is maintained by a rigidly strict supervision of water wells, drains and all sanitation. Gardens and pretty hedges beautify the homes, the walks and the streets of the settlements. There is an air of comfort and cleanliness that is delightful, making the settlements ideal.

The Native Police Force of Nauru Island; a Well-drilled Body of Men, very Useful and Intelligent

Three hundred thousand tons of phosphate-rock is exported every year from the islands. This goes to industries in various parts of the world when the rock is broken and graded up by sulphur and sand. Its action in plants as super-phosphate is almost magic.

French Railway Enterprise in Indo-China

M. Sarraut's Scheme

ONE of the most important steps for the development of Indo-China and Far Eastern communications generally, was announced at the last general meeting of the Compagnie Générale de l'Extreme Orient in Paris. This company is a combine of the strongest French industrial concerns for the advancement of French trade and engineering interests in this part of the world, comprising amongst its shareholders such prominent firms as the Cie de Fives Lille, French Thomson-Houston, Comptoir d'Exportation des Produits Metallurgiques, Société des Aciers de France, Hauts Fourneaux et Fondiers de Pont-a-Mousson, Société des Manufactures des Glaces et Produits Chimiques de Sant Gobain, Chauny et Cirey, Société Française d'Entreprises Industrielles et Commerciales en Chine, Société Industrielle des Telephones, Société Miniere et Metallurgique de Penaroya, Société de Constructions des Batignolles, Rocca, Tassy et de Roux, Delaunay-Belleville, Banque de l'Indo-Chine, with various other well-known French capitalists. As the outcome of an understanding with the governor-general of Indo-China, the component members of the Cie Generale d'Extreme Orient have organized under the direction of the Banque de l'Indo-Chine, the "Syndicat d'Etudes des Chemins de Fer du Sud de l'Indo-Chine" for the purpose of surveying and investigating the lines projected for the south of Indo-China by the governor-general of the colony, generally referred to as M. Sarraut's scheme. This commission has already established offices in Paris and is sending out a large surveying party to make the necessary reports.

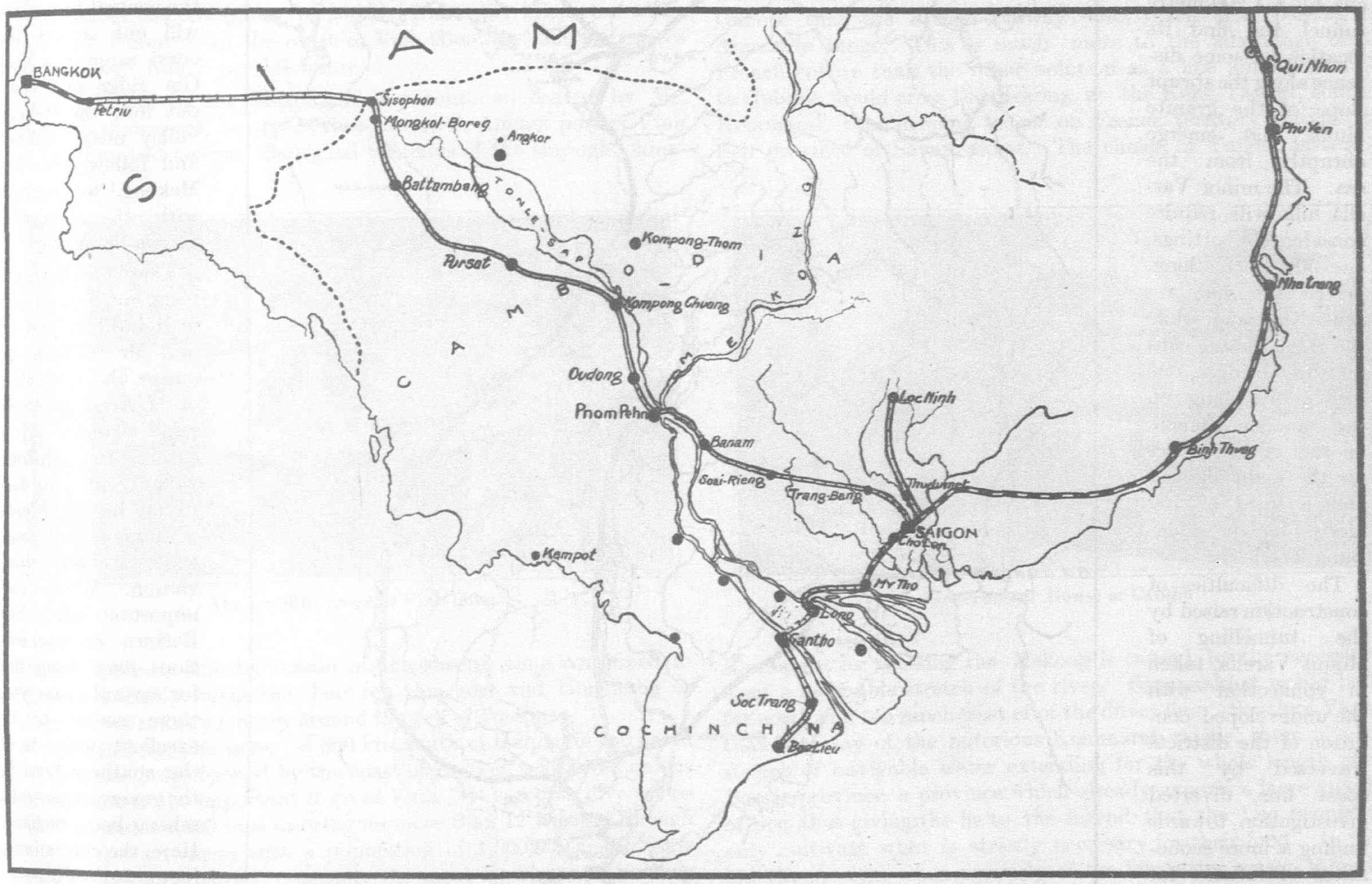
M. Albert Sarraut, Former Governor-General of Indo-China

The French have realized for many years that their colony is the link in an all through rail communication between Europe and Siam, and Singapore, shortening the distance to the East Indies and Australasia, and have directed their diplomacy towards facilitating the construction of lines that would make this feasible. The disorganization of China has prevented further progress in this direction by the construction of lines in this country until the consortium is accepted by the Chinese and the few remaining links in the through system are contracted for. With the completion of the Canton-Hankow line, there will remain only the comparatively short link between Canton, Nanning and Langson to complete the system, or, the same result would be obtained by the completion of the Siems-Cary line from Chuchow in Hunan to Yamchow in Kwangsi, which will pass through Nanning where the short connection with Langson is a comparatively minor matter. The French have been spurred into action by the extension of the Siamese southern lines to connect with the Federated Malay States system, thus making possible a great reduction in time between Europe and Bangkok. The Siamese government has also projected a line running east from the capital to the Cambodian border, where a connection with the Indo-China railways will still further shorten the distance between Saigon, Haiphong, Hanoi and Europe via Suez, and, when conditions are again normal over the trans-Siberian line, and connecting links are built in China, London and Paris would be brought within seventeen days or less with Singapore. The way things are moving, with Siam pushing her system steadily ahead and the French concentrating on their part of this general scheme, the last to swing into line will be China.

The French end of this great scheme is simple, calling for the construction of a coast line from Nhatrang to Tourane, a distance of 530 kilometres, and another link from Saigon westwards through Phnom-Penh to Battambang and the Siamese border, a distance of 645 kilometres, or, a total of some 1,175 kilometres of new lines to link Singapore with Langson, on the Chinese border.

Probably the most important and urgent from the French view point is the southern line extending west from Saigon to the Siamese border and the extension from that point to Bangkok or the terminus of the Siamese lines at Petriu. This is the principal line in the scheme advocated by Governor-General Sarraut, and is to start from Saigon, the capital of Cochin-China, and pass through Pnom-Penh, capital of Cambodia, and thence through sparsely populated districts to Battambang and the Siamese frontier and on to Bangkok or Petriu. The section in Siamese territory, however, will only be taken in hand after the proper authority has been obtained through negotiations with the Siamese government. Through Bangkok, this line, as pointed out above, will have connections with the existing railways in the Federated Malay States, and with India, when the proposed section between Moulmein and Chengmai is completed by the Indian and Siamese authorities. This line, therefore, will not only facilitate intercourse between Indo-China, Siam, Federated Malay States and India, but open up to development the southern lake district of Tonle-Sap.

The first section of this line west from Saigon will follow the valley of the Mekong through Trang Bang, Soairieng and Banam to Pnom-Penh, crossing on its way the Great Vaico, the Small Vaico, the Kompong Trabor, the Banam and the Mekong Rivers, the width of this last being 1,200 metres with a depth of 15 metres. The second section proceeds up the Tonle-Sap valley following the river about 10 kilometres distant, instead of adhering to the old project around the north end of the lakes connecting Kompong Thom and Angkor. As the road from Pnom-Penh to Kompong Thom will be finished this year, and then extended to Angkor, it seemed preferable under the circumstances to follow the southern route which is 50 kilometres shorter and has the added advantage of connecting the important centres of Kompong-Loung, Oudong, Kompong Chuang, Battambang, Mong-Kol-Borey and Sisophon. The third section of the line passes through the valley of the Great Lakes at a slight elevation above flood level and thence up the Stung valley to the Siamese frontier.



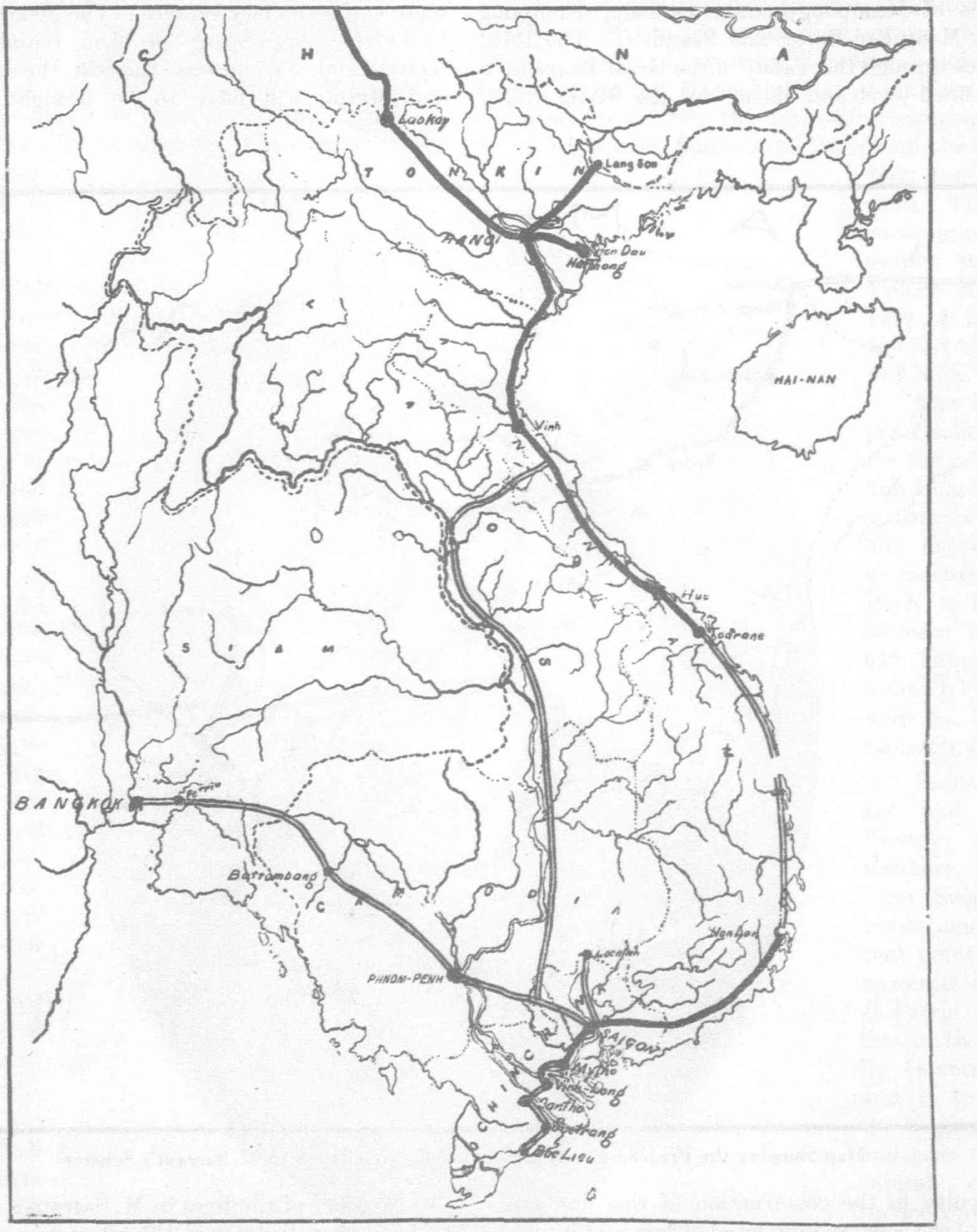
Map Showing the Projected Southern Indo-China Railways in M. Sarraut's Scheme

The greatest difficulty in the construction of this line arises from the low elevation of the country inundated at frequent intervals by the rise in the many rivers and requiring high embankments for at least three quarters of the entire distance. Furthermore, these conditions necessitate a large number of bridges, the longest being one over the Mekong, 1,200 metres; the Bassac, 280 metres and the Great Vaico, 140 metres. This bridge work will greatly increase the cost of construction, that otherwise, would be comparatively cheap.

Another important line advocated by M. Sarraut for the south of Cochin-China will run across the delta from the terminus of the existing Saigon-Mytho line. For many years the business element of Saigon has been demanding the extension of the Saigon-Mytho line (69 kilometres) to Baclieu passing through the important centres of Vinh-Long, Cantho, Cairang and Soctrang. The execution of this work has always been defeated because of the admirable system of navigable waterways serving this district, and the high cost of building the long bridges over the various branches of the Mekong. The sudden development however of Western Cochin-China resulting from the deepening of canals for the past twenty years, has necessitated regular and economical rapid transport system in order to facilitate passenger and goods traffic between the high and low lands. In locating this line it has been difficult to connect the larger centres in a manner that harmonized with the possible sites for the more important bridge and embankment works. Three gigantic bridges would have to be constructed, one over the Mekong, 1,400 metres, over the Song-Cochien, 600 metres and another over the Bassic of 1,400 metres, in addition to 1,600 metres of secondary bridges. The Mekong Bridge alone presents a formidable engineering problem requiring pier foundations 40 metres deep. To increase the cost, the existing line between Saigon and Mytho will have to be brought up to standard working condition.

Another of the lines in M. Sarraut's scheme is one from Saigon to Locninh a distance of 125 kilometres, to tap the red lands of the Thudaumot province and contribute to developing the cultivation of rubber in that district. From this line, two others will branch off, one traversing Cambodia towards the Mekong to open up the Southern Laos, the other striking north towards Tourane through the South Annam table-lands. The Locninh line will connect with the existing Saigon Nhatrang line at Binh-Trieu station and proceed up the Saigon River district through Laithien to Thudaumot, and from here strike through the hills between the Saigon river and the Song Be passing through Xa-Trach, Hongquan to Locninh. This line is therefore one for the development of agriculture in Northern Cochin-China and Eastern Cambodia and will solve the problem of bringing labor to the districts and facilitate the opening of new lands.

In addition to these schemes for the development of South Indo-China which the engineers of the new French company are now studying, there remains the larger and more important plan to connect the north and south of the colony by a direct line through the interior following the valley of the Mekong. The coast line which will eventually link up the two extremes of the colony now terminates at Tourane, half way down the coast. Between Tourane and Quinhon (300 kilometres) the line will traverse a cultivated and inhabited flat country cut by small hills of the Annamite chain. It presents no great engineering difficulties but necessitates a great number of bridges and fairly high embankments in the low lands of the deltas of the streams and rivers coming from the coast range. Between Quinhon and Nhatrang (230 kilometres) this line will open up Ninh-Hoa and the Tuyhoa district where an irrigation system of 17,000 hectares is to be developed but will have to pass through Mount Varella by a 1,200-metre tunnel and find its location for some distance along the abrupt slope of the granite bluffs that emerge abruptly from the sea. The minor Varella hills will require considerable cuttings, one 500 metres long, before the line reaches Nhatrang, while the Song-Darang calls for three bridges, one 150 metres long on the smaller branch, another of 600 metres for the main channel and a third of 150 metres for the Song-Bang Trach.



Railway Map of Indo-China Showing the Projected Mekong Valley Line

The difficulties of construction raised by the tunnelling of Mount Varella, taken in connection with the undeveloped condition of the districts traversed by this coast line, diverted investigation towards finding a more economical location for joining North and South Indo-China through the Annamite chain and the South Annam table-land into the valley of the Mekong and then down the incline to Saigon, opening up the rich forest lands of the interior and the famous red lands of Cambodia and Cochin-China. Politically, such a line had much to commend itself to the authorities as it facilitated extension of control over the Mois people who are still semi-independent.

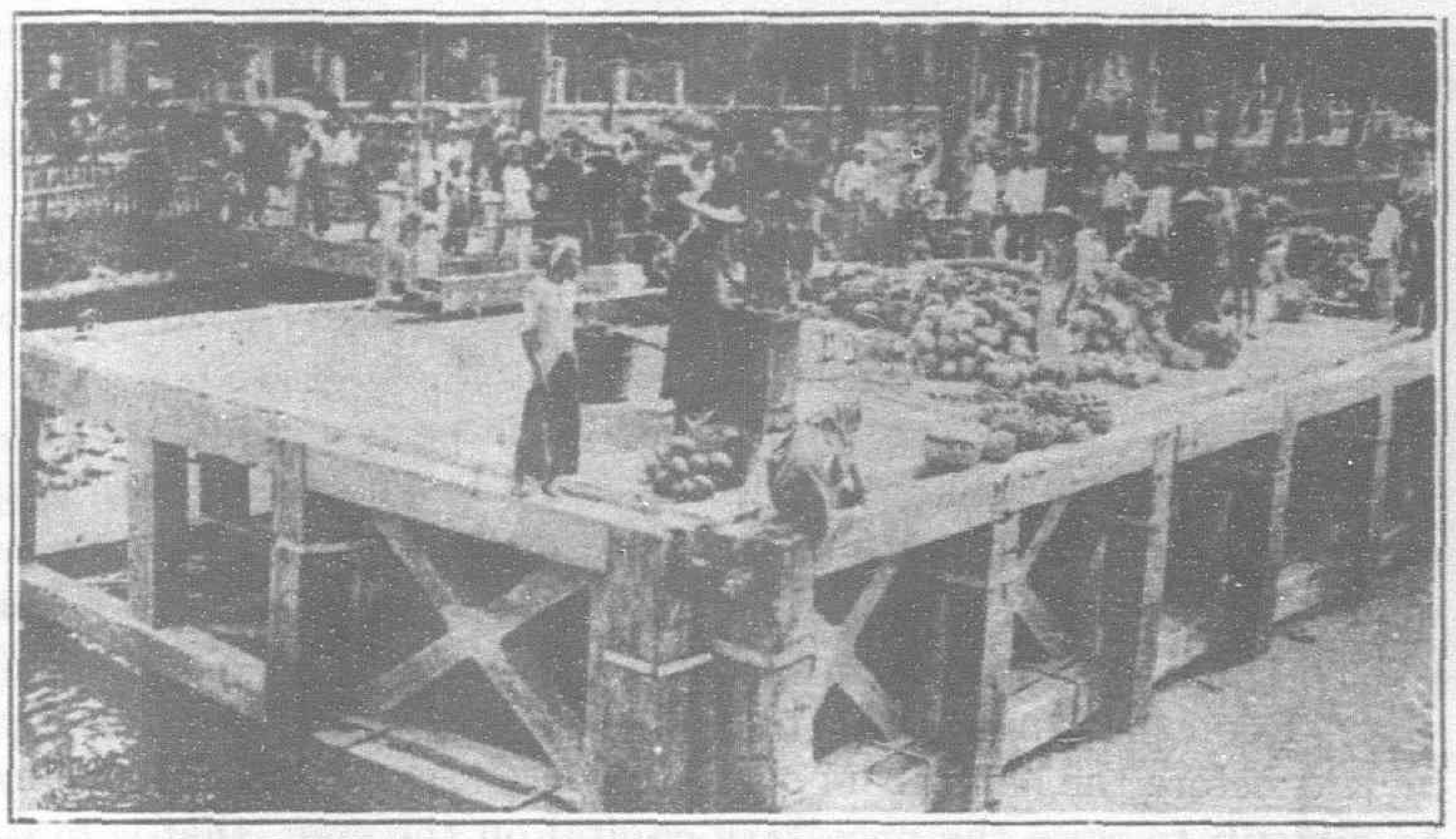
It has been urged that the Tourane-Nhatrang section of the coast line is not vitally essential, as the ports are well served by an admirable coasting service, and the motor roads now under construction will meet for a long time the needs of travelers. Naturally, the idea of suspending construction on the through coast line, in favor of the interior line, has opened up considerable discussion in Indo-China, and when the advantages of the latter are viewed from the political and strategical standpoint, it is easy to understand that it meets with the endorsement of the governor-general. Under existing conditions, the coast lines, exposed to the sea or within easy reach of a hostile landing party, constitute a military weakness. The interior line is, therefore, of the highest strategical importance for the proper defense of the colony. It is also urged in favor of this route that when the Saigon-Pnom-Penh section of the line to Siam is constructed, it will pass through Payninh, where it would join the the Mekong line, thus shortening the total distance to a point where the Mekong line would not exceed in length the uncompleted sections of the coast line. No headway will be made in the construction of these two lines until a final decision is arrived at as to whether to continue the construction of the exposed coast line or proceed with the central line which will cut across the coast range the Meu-Gia ridge and come out into the Mekong valley near Thakhek and follow down the Mekong to connect with the projected Saigon-Siam line.

These questions are being freely discussed in Indo-Chine and we find Mr. H. Cucherousset, the able editor of *"L'Eveil Economique,"* strongly advocating the Mekong valley route and fortifying his arguments with maps and plans which carry conviction. While this important link in Far Eastern communications may hang fire for several years yet, there seems to be excellent prospects of the southern lines in the governor-general's scheme being realized. Here, the determining factor is the excessive costs of enormous bridge work, offset to some extent by the extremely low cost of labor for general construction. Past experiences have taught the French railway engineers to be cautious in their estimates for construction in the interior districts, especially in the deep valleys of the Mekong and other rivers that flow down from the Himalayas. The construction costs of the Yunnan Railway jumped to almost prohibitive prices because of the great mortality of the laborers, who sickened and died like flies from the miasma that came from the rivers and the breaking of new ground. For instance, the Haiphong-Yunnan line with a total length of 853 kilometres (386 km. in Tonkin and 467 in Yunnan) cost 237,047,000 francs, of which 71,580,000 francs is charged against the Tonkin section and 165,466,000 to the Yunnan section, or about 185,000 francs per kilometre in Tonkin and 354,000 francs per kilometre in Yunnan, approximately twice as much as

Rail Depot along the Line of the Coast Railway in Indo-China

the section in Tonkin. In the colony proper, the most expensive line was the one from Hanoi to Namquan (167 km.) which cost to construct 41,034,000 francs, or 245,000 francs per kilometre. The line from Hanoi down the coast to Vinh (Benthuy) 326 kilometres cost 134,000 francs per kilometre.

Reverting to the Mekong Valley route advocated by Mr. Henri Cucherousset, he argues that the north Annam port of Vinh or Benthuy will become the logical terminus of the through China-Bangkok-Straits line by reason of the shorter time consumed in direct steamship navigation between this port and Hongkong or Canton over railway journey around the gulf of Tonkin.



The Landing Stage at Vinh-Long

"Benthuy," he says, "is 300 km. south of Haiphong and north of the great bulge formed by the coast of Annam, is situated on the river Ca, near the important town of Vinh. It can only give access to ships under 1,500 tons drawing no more than 12 feet. Although it taps two provinces with a population of 1,500,000 inhabitants and has large industries, especially the meat freezing and packing firm of P. A. Lapicque & Co., the building of which has cost 800,000 dollars, it is not proposed to do more than make the access a little easier to 1,000 tons steamers especially constructed for a regular fast passenger service with Hongkong. For the rest the present sea launches and lighters towed to the Bay d'Along or Haiphong will suffice. Benthuy is connected by rail with Hanoi and Haiphong but direct steamship line from Hongkong would save 14 hours railway journey whilst the sea journey would only be five or six hours longer than from Hongkong to Haiphong.

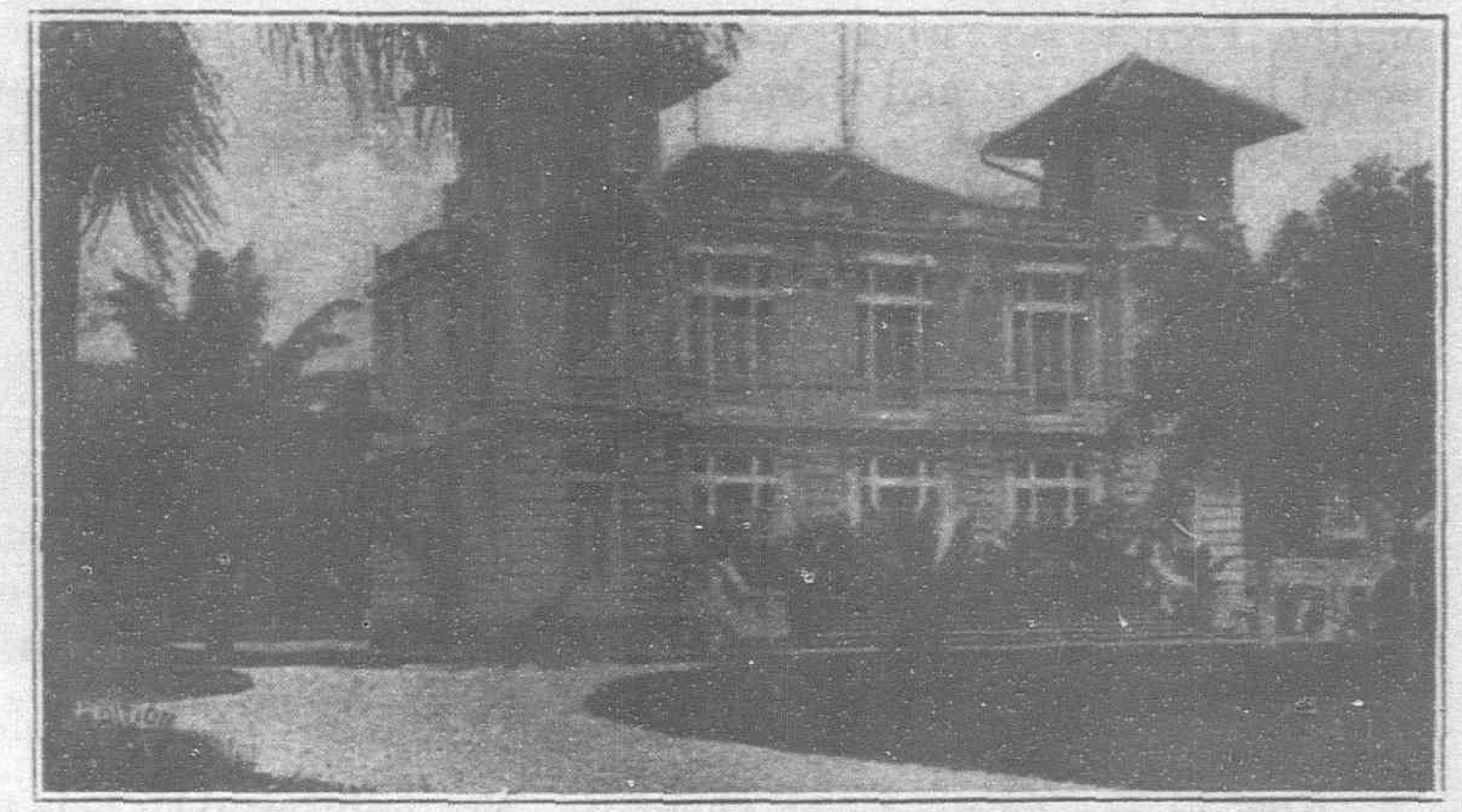
"Therefore Benthuy must be for Hongkong and Canton the head of the line to Bangkok. The distance from Benthuy to Bangkok would be about 1,000 kilometres; from Hanoi 1,325; and from Haiphong 1,427.

"The railway is under construction south of Benthuy and will join the existing railway of Tourane to Hue and Dongha. It follows the coast and will be eventually continued down south until it meets the 410 km. long railway from Saigon.

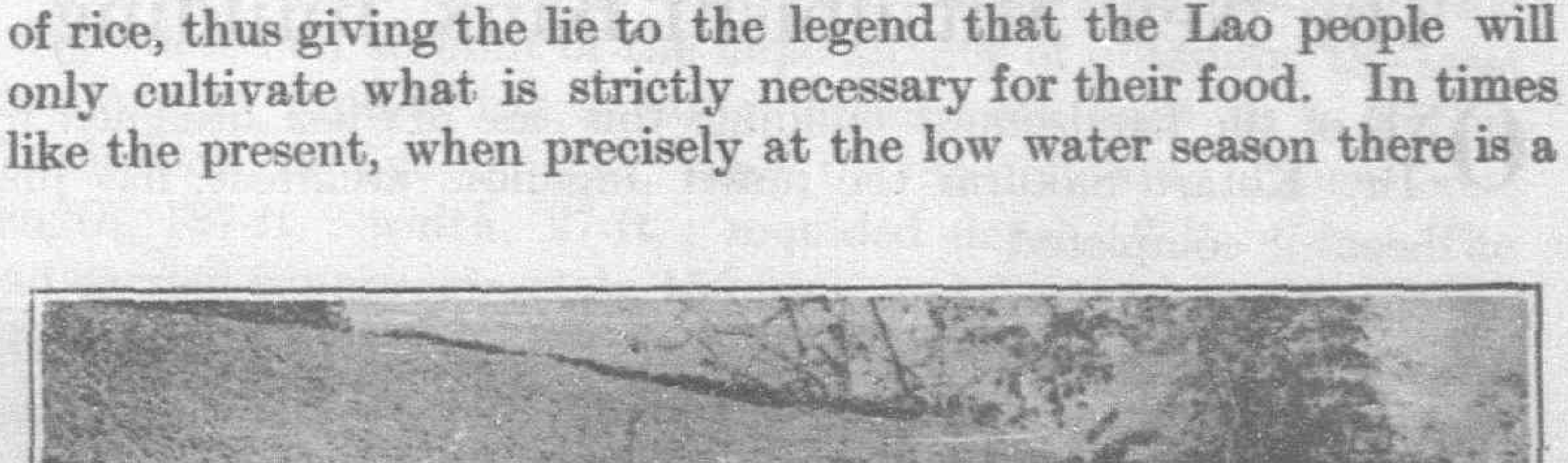
"On leaving Vinh-Benthuy the proposed Mekong Valley line railway follows the rich and beautiful valley of the Ngan Sau river; from that valley it passes to another which comes from Laos and runs southwards to the sea near Dong Hoi. The upper part of that second valley makes a deep cut through the Annamite Range and leads to a pass, the Meu Gia pass, which is one of lowest in that enormous and prohibitive chain of mountains. Through that upper valley and the Meu Gia pass a railway detached at Tan Ap from the coast railway could be easily constructed.

"Now from the Meu Gia pass the route to be followed depended entirely on Siam's railway policy. If the old plan of a railway from Korat to Roi-ed, with two branches, one from Roi-ed to Nongkhay and the other from Roi-ed to Nakon Panom had been followed, it is evident that after leaving the Meu Gia pass the French railway would have reached the Mekong by the shortest way, at Thakhet, opposite Nakon Panom. The distance from Thakhet to Tan Ap would have been about 190 km. or 280 from Benthuy.

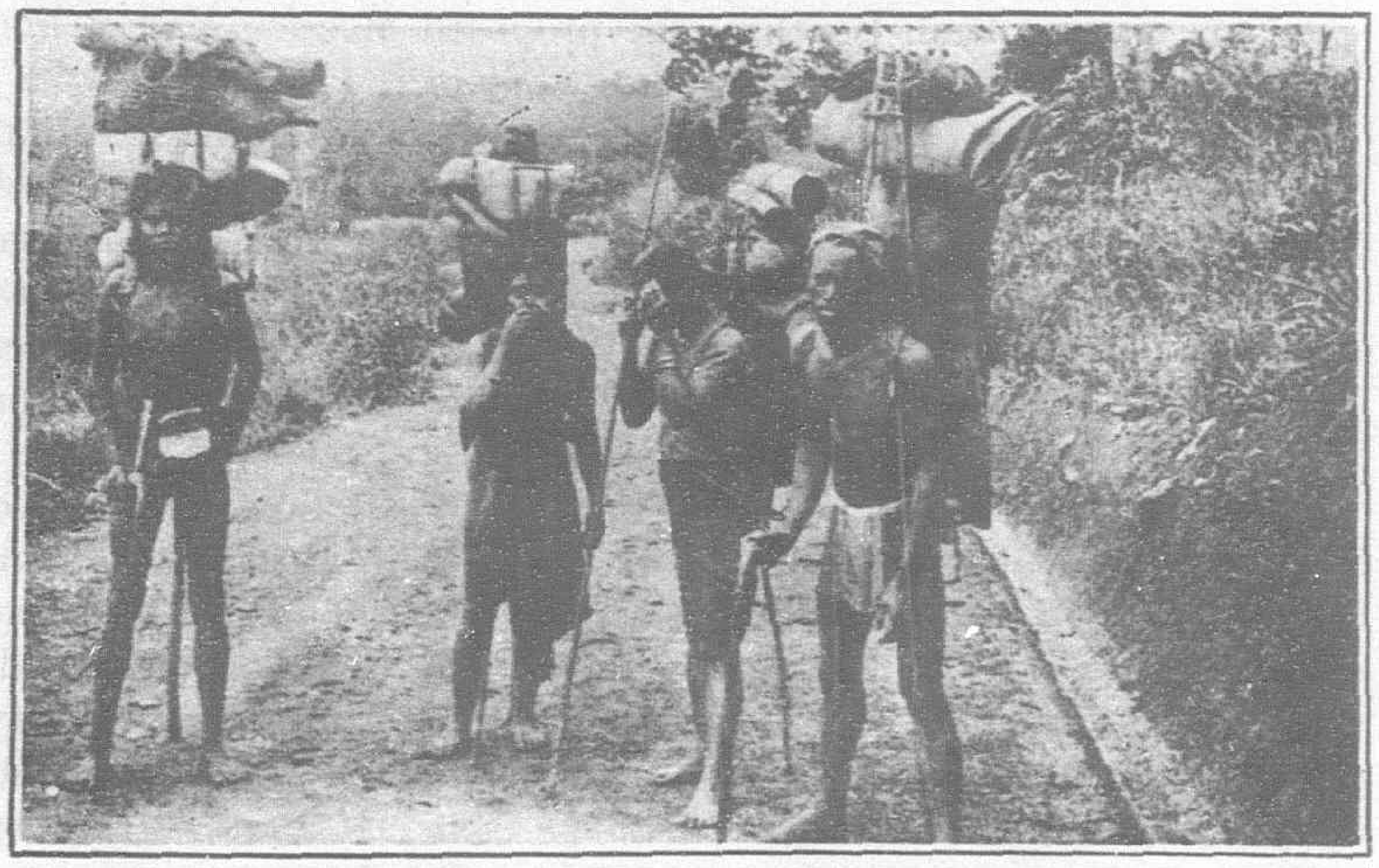
"But Siam has decided to continue the Khorat railway toward Oubone, which is 300 km. south of Lakon Panom. It is, therefore, Oubone that the French railway must reach after passing the Annamite range. This is much more to the advantage of the French colony than the other solution as a line joining Meu Gia to Oubone would cross the Mekong at the Keng Yapeut, south of Kemmarat, thus keeping longer on French territory through the rich province of Savannakhet. The choice of Yapeut instead of Kemmarat for crossing the Mekong is caused by the necessity to meet a navigable stretch of the river. Savannakhet would be too far north and too much west of of the direct line. South of Yapeut, that is to say of the notorious Kemmarat rapids, there is a long stretch of navigable water extending for the whole length of the Bassac province, a province which already exports a large quantity of rice, thus giving the lie to the legend that the Lao people will only cultivate what is strictly necessary for their food. In times like the present, when precisely at the low water season there is a



Government House at Cantho



Plantation Workers in Thudaumot Province



Mois on their Way to the Coast to Barter

Coolies Repairing a Dyke

dearth of rice in Siam, the exportation of Bassac rice, practically impossible by the Mekong, would then be diverted to Siam.

"The total length of the proposed railway, from Oubone, the terminus of the railway now under construction by Siam, to Tan Ap where the line would branch from the French coastal railway would be about 460 km. of which 370 would be on French and 90 on Siamese territory.

"The only difficulties would be on the first eighty kilometres on the French side where a lot of tunnelling and small bridges would be necessary; and then bridging of the large rivers Se Ban Bangfai, Mekong and Se Mool. The difficulties near the Meu Gia pass, however, would be nothing compared with those the French engineers so successfully overcame in Yunnan, and the bridging of the Sebangfai and Se Mool would be made in the dry season when the greater part of the work would be in dry ground. As for the Mekong it is the easiest river in the world to bridge, as at very frequent intervals there are across the bed of the river gigantic barrages of enormous rocks which appear at the low water season leaving only a number of narrow channels. So no foundations would have to be made under the water or in bad ground; it would only be a question of how many tons of steel. Would the railway be a paying proposition?"

"There can be no doubt about it. Not only would it help to develop very rich districts where rice, tobacco and cotton can be cultivated and cattle bred in large numbers with beautiful forests of easy access from the proposed railway and several copper and tin mines, but it would bring to the port of Benthuy and secure for Bangkok a large part of the Mekong trade. That can now, with very poor communications and a population which has nothing to incite it to work, he estimated at 80,000 tons. It would soon be trebled as the Lao population would be encouraged by the new facilities to dispose of their products and receive at reasonable price manufactured goods, and as there would be soon a great movement of immigration from Tonkin. The Tonkinese who are overcrowded in their delta, are active and willingly emigrate when easy communications leave them the possibility of going back home at any time. Already they come in large numbers along the Mekong in spite of enormous difficulties and the Annamite population of Vientiane for instance passed from 1,200 to 6,000 between 1914 and 1920.

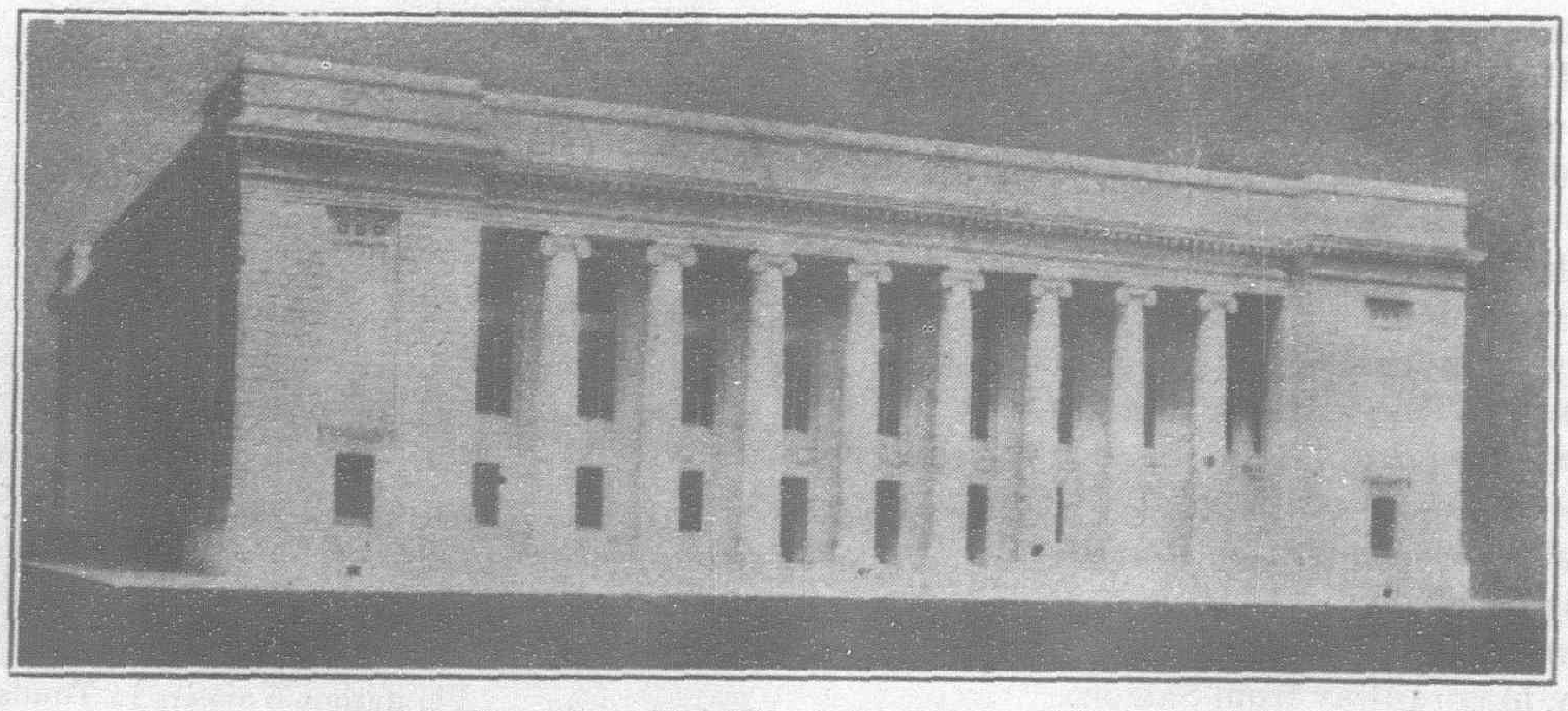
"The railway would also be used by the Tonkinese emigrating to Cambodia and North Cochin-China where already thousands are employed on the rubber plantations.

"Then as an international railway the proposed line would be of immense value. Bangkok would cease to be an out-of-the-way place to become the centre of a new system of communications and many of the travelers from Hongkong to Siam would close that way.

"I consider that this is one of the finest propositions that can be laid before the capitalists of the Far East, and that it should not be difficult to raise the necessary capital on the spot, that is to say between Bangkok, Singapore, Saigon, Haiphong and Hongkong. The cost would probably average 50,000 ticals a kilometre or about 20,000,000 ticals as it is probable that the Siamese state railways will build their part of the line up to the Mekong on the resources of the Siamese budget."

The New Mitsubishi Bank Building

ONE of the handsomest buildings this side of Suez, designed by Dr. Kotaro Sakurai the noted Japanese architect, has just been completed for the home of the Mitsubishi Bank opposite the Municipal Hall in Tokio. It is pure Grecian Ionic in outline similar to the United States Treasury, with a row of eight massive stone columns on the facade. The dimensions of the building are about 200 by 180 feet. The framework is of steel imported from the United States. The feature of the main floor, the huge banking room, will be 70 feet wide by 140 feet long and 45 feet high, finished in terracotta imported from America, with floors of Italian marble. Massive bronze doors, bronze railings and counter screens were also imported from America. The vaults and doors came from England. The building is equipped with three elevators. The construction of the building which was carried out under the supervision of the architect by the Mitsubishi estate department has cost about Y.3,000,000.



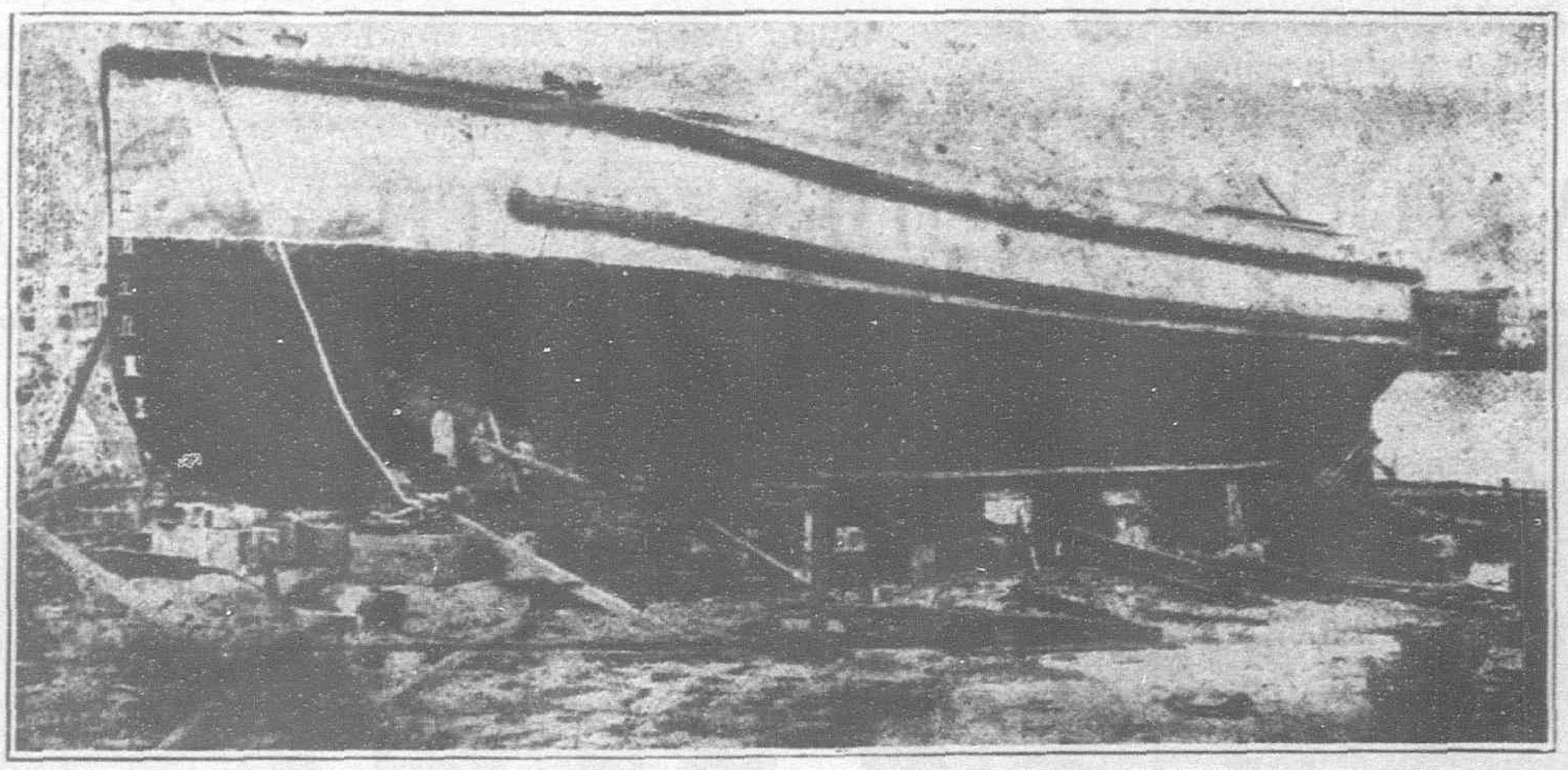
The New Mitsubishi Bank Building at Tokio

Reinforced Concrete Ships in the Orient

WITHIN the last few years, not only river barges, but cargo-boats of several thousand tons burden, have been successfully built of reinforced concrete, and have proved by their general seaworthiness, their right to a place in the front rank side by side with steel or wooden vessels. Such ships are now being built regularly in England and the United States as well as in other countries where steel is even more expensive.

The war brought to the notice of those interested, the fact that reinforced concrete has the same qualities essential to shipbuilding as timber or steel, viz.—strength, water-tightness and—in spite of a widespread impression to the contrary—elasticity. To this latter quality any contractor who has handled long piles, or made tests on reinforced concrete floors or bridges will testify, when the test load is removed the deflection disappears, and the structure perfectly elastic, returns to its original form.

In 1915 it became necessary to replace the vessels sunk by German torpedoes, and rapid construction was essential. Steel was becoming scarce and expensive. Timber was first thought of and as stocks ,of seasoned timber were getting very low, American forests were felled and turned, all too quickly, into large vessels. The check received by this timber fleet is common knowledge. On second thought reinforced concrete was adopted with complete success. The constructional problems presented were successfully met, and experience has proved the ample constructional strength of ships built of this material.



Concrete Barge built at the Hongkong Works of Brossard-Mopin

Reinforced concrete vessels show two advantageous qualities; in addition to being good sea boats and behaving admirably in heavy weather, their vibration is much less than in steel boats, and the period of roll much longer. No leakages have been reported, but a few fine cracks in the shell and bulkheads of ships in service have been noticed. These cracks proved unimportant and have no effect on the structural strength of the ship. These vessels however require more adequate fendering than steel boats.

Experience shows that severe concentrated blows on the shell, such as would only indent the steel plates, tend to shatter the concrete around the point of impact. Adequate fenders would permit the absorption of such shocks by a resitient material and obviate this disadvantage. These remarks apply particularly to barges. It has been found, however, that repairs are relatively simple in such cases, and can be effected by any handy man with little loss of time and at a slight expense, which is more than compensated by the elimination of the heavy maintenance charges for a steel vessel occasioned by the continual fight with rust.

The rapidity of construction of reinforced concrete ships is practically independent of size, as the number of workmen employed at the same time is proportional to the volume of concrete in the structure, which volume is in turn proportional to the tonnage of the vessel. The time of construction for a yard with ordinary equipment varies from five to six months for the hull. The fitting out of a reinforced concrete vessel requires the same time as for a steel one. A comparison of a steel and a concrete vessel of the same deadweight carrying capacity reveals the fact that the concrete ship, on account of the greater weight of the hull, must have greater dimensions than the steel ship, and in consequence, greater hold spaces. For heavy cargoes, such as coal, ore, oil and steel billets, as the deadweight capacity will be reached in both cases before the holds are filled, the steel ship has an advantage over concrete as the material of construction, other factors being equal.—For light cargoes, on the contrary, the increased hold volume of the concrete vessel reverses the position—the steel vessel being filled before its full deadweight capacity is reached.

In the design of a steel ship straight lines are adopted as far as possible, whereas for the concrete vessel long, sweeping curves are desirable for economical construction. A concrete ship will hence have finer lines than an equivalent steel vessel, thus offsetting again, by a diminished resistance to propulsion, the increased operating charges caused by greater displacement. The employment of reinforced concrete has, in addition to its usual advantages, special interest in the Orient; the bulk of the labor required, as has been amply demonstrated in the construction of ships already launched, need not be especially skilled, and is thus easily obtained, the majority of the materials required are available on the spot and of excellent quality; rapid construction is easy where labor is plentiful and cheap.

In the Far East the Etablissement Brossard, Mopin, Contractors, the pioneers of reinforced concrete ships on this side of the world, have successfully launched several such; details of three typical examples are given below:

1. *Barges Launched Six Years Ago at Saigon.*—These barges were employed as pontoons carrying steam driven pile drivers without showing any trace of damage resulting from the severe shocks to which they were subjected, and are still employed for the transport of materials for public works, and as house-boats, sheltering the firm's agents in the vicinity of works in progress in the bush.

2. *Ferry-boat Built at Singapore* to carry wagons of the Federated Malay States railways across the narrows to Johore. This boat, ordered on account of the impossibility of obtaining the steel necessary to replace the existing ferries, was built to a similar specification in five months' time to the following dimensions: Length, 127-ft.; width, 27-ft.; moulded depth, 7-ft. 6-in. The load carried is approximately 150 tons, and for the last three years this ferry has made several trips a day carrying six goods wagons from the island to the continent without showing any sign of fatigue or damage, and remains perfectly water-tight.

3. *Cargo Boat—" Cochin-chine."*—Externally the hull has exactly the same lines as a steel or a timber hull, its curves having been determined in the same manner as such hulls. The following are the general dimensions of this ship: Length between perpendiculars, 269-ft.; moulded width, 38-ft.; moulded depth 24-ft. 6-in.; average loaded draught, 19-ft.; corresponding displacement, 4,500 tons; draught empty, 11-ft.; oil tanks (combustible) and fresh water, 240 tons; provisions and various supplies, 24 tons; cargo, 2,000 tons; volume of the four holds, 37,000 cu. ft.; horsepower, 1,000; number of screws, 2; speed, 10.4 knots.

Internally the hull is built on a special honeycomb system of great strength, combined with minimum weight. The main frames are formed by joining up the bottom, side and deck beams. The construction on this system of such a vessel as the *Cochin-chine* demands of the workmen, skill, handiness and patience, such as are the special attributes of Far Eastern races, and it is for this reason that the constructors, experts in reinforced concrete work, having already successfully launched several barges and a ferry-boat, had no hesitation in undertaking a construction of such importance.

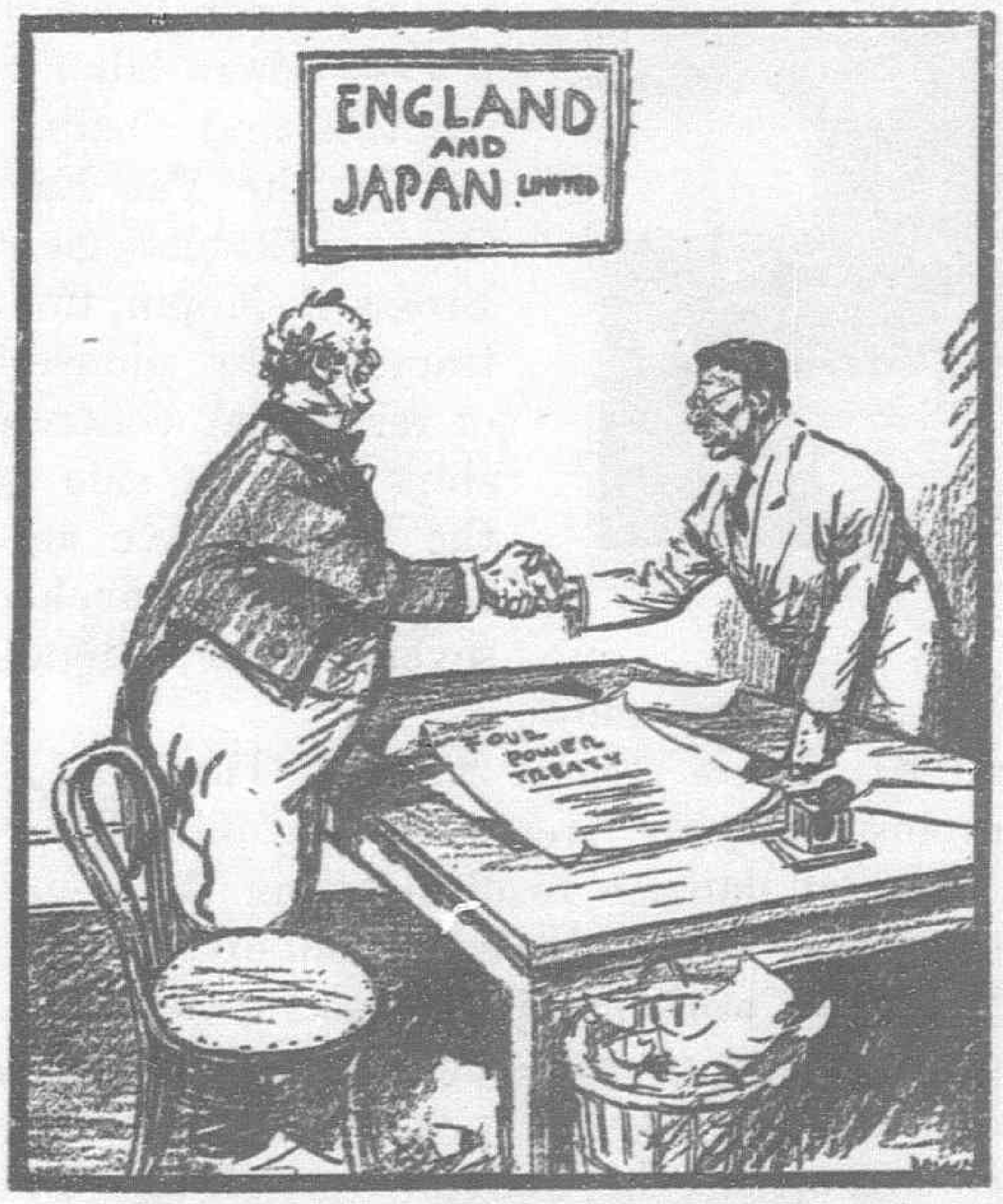
Engines—The twin screws are driven by two Diesel engines of 500 hp. each, having six cylinders, and turning at 187 R.P.M., built by Messrs. McIntosh & Seymour at Auburn (New York). These engines gave an officially recorded speed of 10.4 knots at the trials. Their consumption is 0.955-lb. of oil per horse-power hour, and as the tanks have a capacity of 240 tons of oil, the vessel can be navigated during 40 days without replenishing. As this vessel was built during the war, the shortage of materials forced the builders to utilize engines, and above all fittings such as could be obtained, and far in excess of the strength required for such a ship. For this reason certain figures given above are somewhat unusual; some 150 tons of carrying capacity being lost in this way.

The *Chinchine* which was built under the supervision of the bureau veitas, is classed by that corporation I. 3/3. G. 1. 1. and is insured under similar conditions to steel or wooden vessels. Since her trials, which took place in December 1919, she has maintained a regular service between Singapore, Saigon and Haiphong and in March 1920, transported two military contingents of 500 to 600 men, each from Saigon to Haiphong in addition to her cargo.

This vessel has proved altogether seaworthy, and on account of the large diameter of her screws, manœuvres very easily and can be brought to a standstill in her own length. The hull of the *Cochin-chine* described above contains 1,200 tons of concrete reinforced with 300 tons of steel. An equivalent steel ship would require some 1,300 tons of steel sections and plates. The difference in weight is not very considerable. On substracting the weight of steel bars in either case there remains 1,200 tons of concrete as against 1,000 tons of steel, which latter would obviously cost far more than 1,200 tons of concrete, in fact the concrete hull would cost at the time of writing some 50 to 60 per cent. less than the steel one.—A very remarkable difference.

The most interesting application of reinforced concrete in the Far East at the present time is undoubtedly to the construction of coasting steamers and boats for river traffic. The development of this trade provides a very interesting investment, especially in view of the present situation with regard to shipping. Overseas freightage rates are falling rapidly and many vessels are immobilized, whereas, on the contrary, a fact worthy of attention, coastal and river rates steadily maintain their high level.

THE CARTOONISTS' IDEA OF THE CONFERENCE



DISSOLVING THE PARTNERSHIP
By Rollin in the New York *World*

CHINESE TERRITORY
FRANCE
ENGLAND
JAPAN
MEBBY NICE GENTLEMAN LIKE YOU WILL MAKE OTHER NICE GENTLEMEN WITH GUNS GET OUT OF MY HOUSE!
I'D RATHER TALK OF DISARMAMENT AND OTHER THINGS
CHINA
DISARMAMENT CONFERENCE

MAYBE THEY WILL STAY RIGHT THERE
By Walker in the New York *Call*

THAT'S NOT THE WAY TO REDUCE
The Philadelphia *North American*

"WATCH YOUR STEP"
By Window McCAY in *The American*

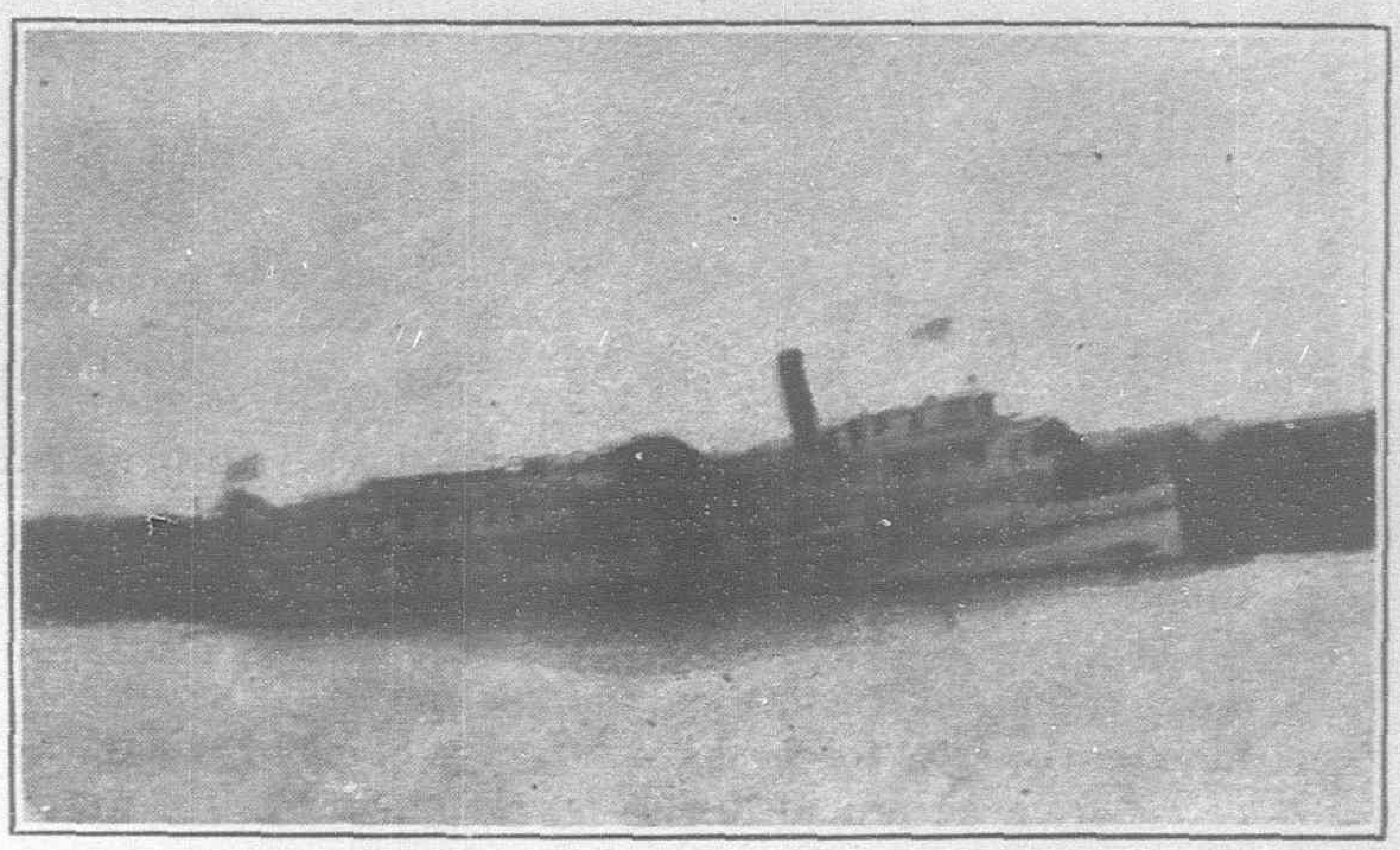
IN HIS OWN KITCHEN TOO!
By Rollin in the New York *World*

THE OPEN DOOR
By Marcus in the New York *Times*

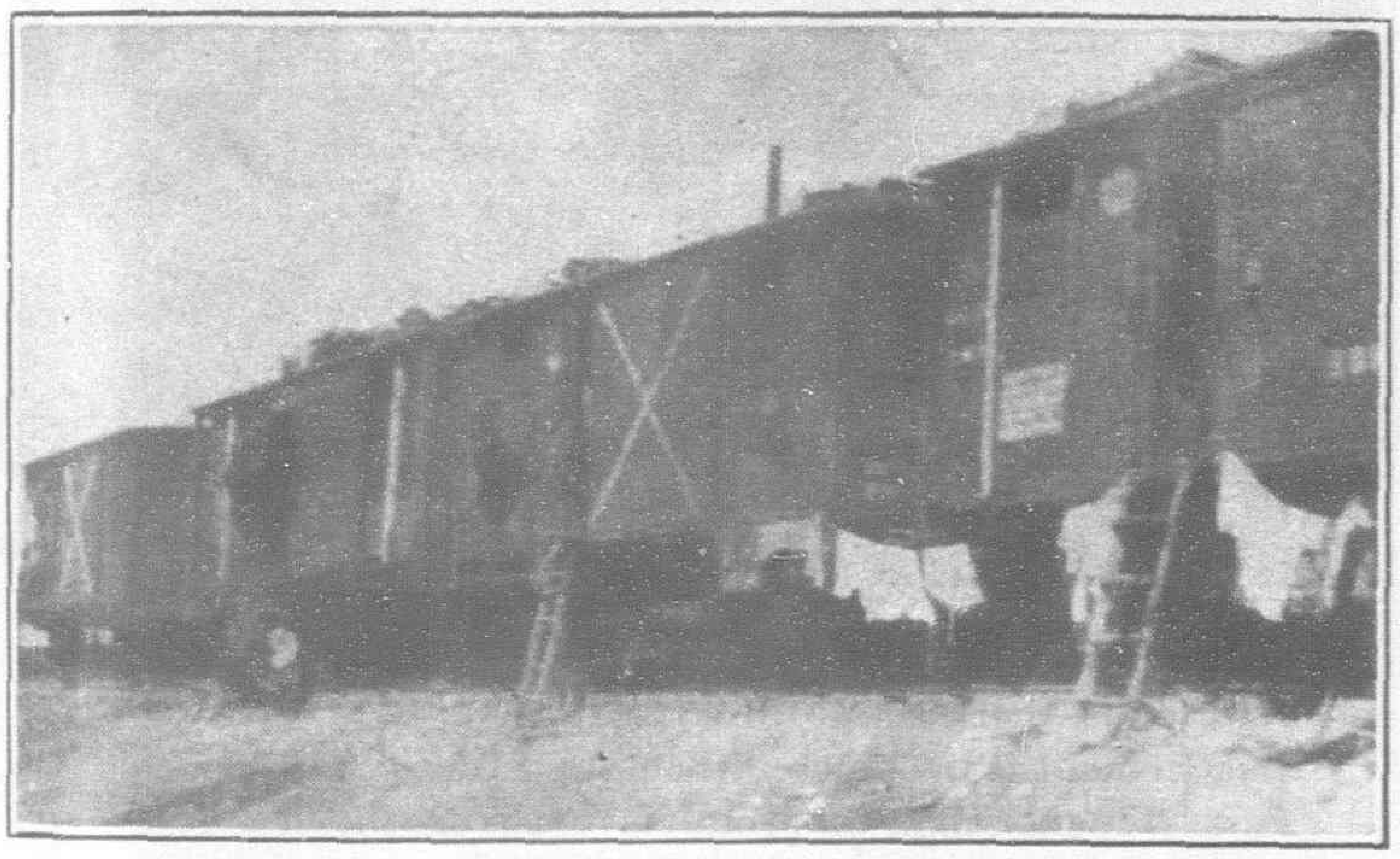
Re-birth of Industry and Commerce in Eastern Siberia

By Orrin Keith

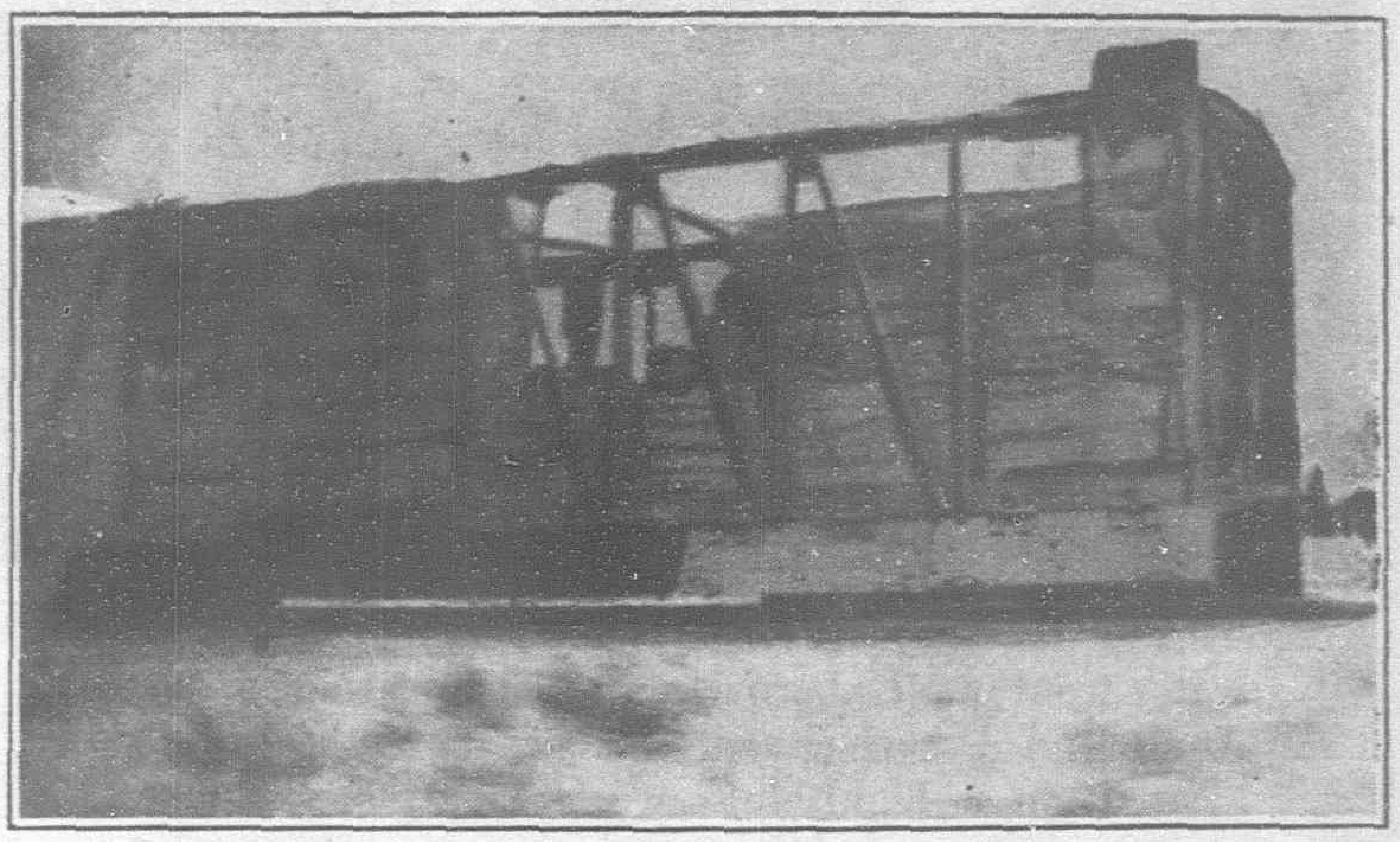
The central fact in the life of the citizens of the Far Eastern Republic is the railroad. Fortunately revolution and civil war, while they destroyed most of the bridges, left nearly all the stations intact. This is the station at Khilok.



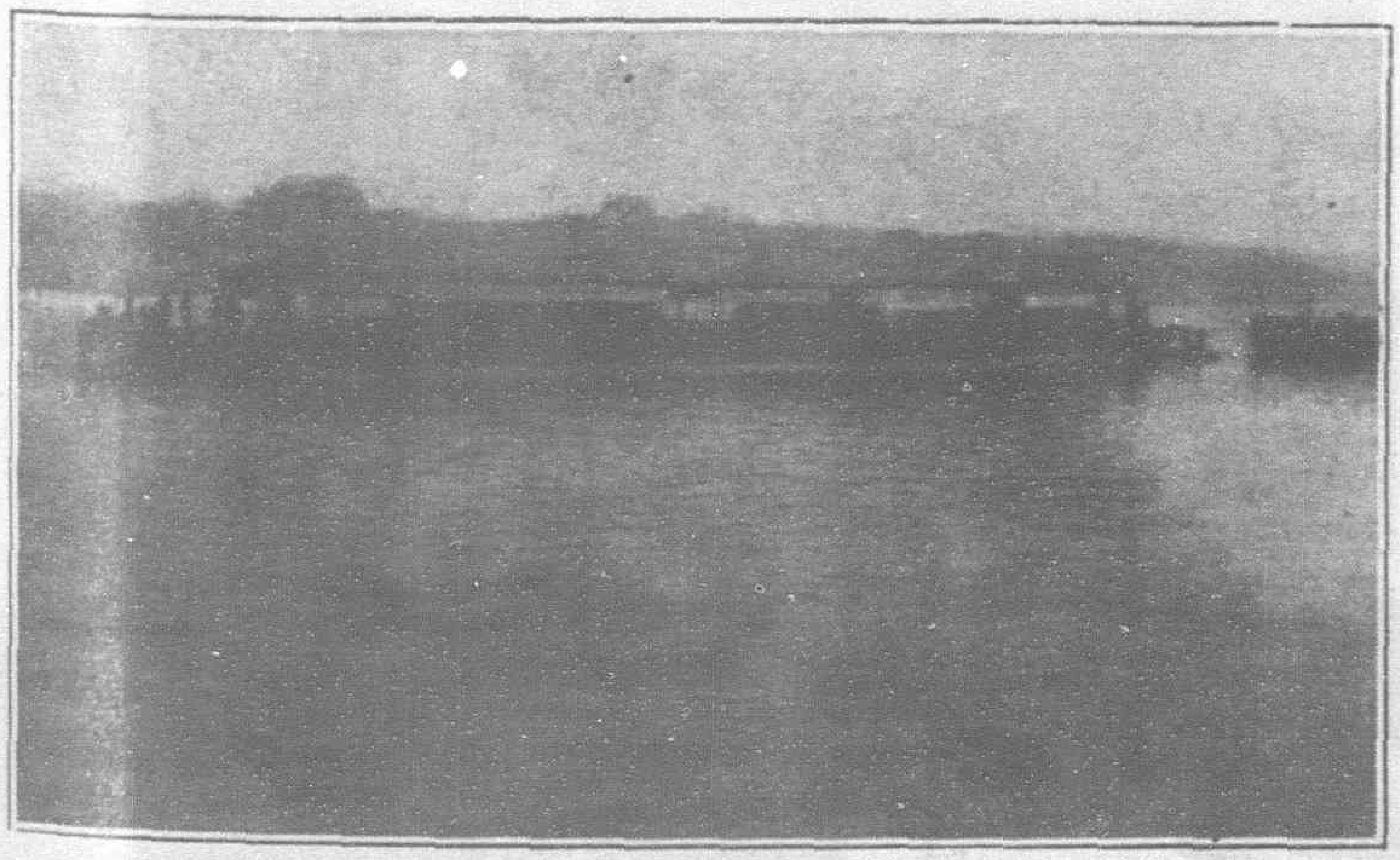
The burden on the railroad is relieved during the summer by steamers on the long navigable rivers of Siberia. Regular service connects the river ports from Stretensk to Nikolaievsk and from Blagoveschensk up the Sungari to Harbin.



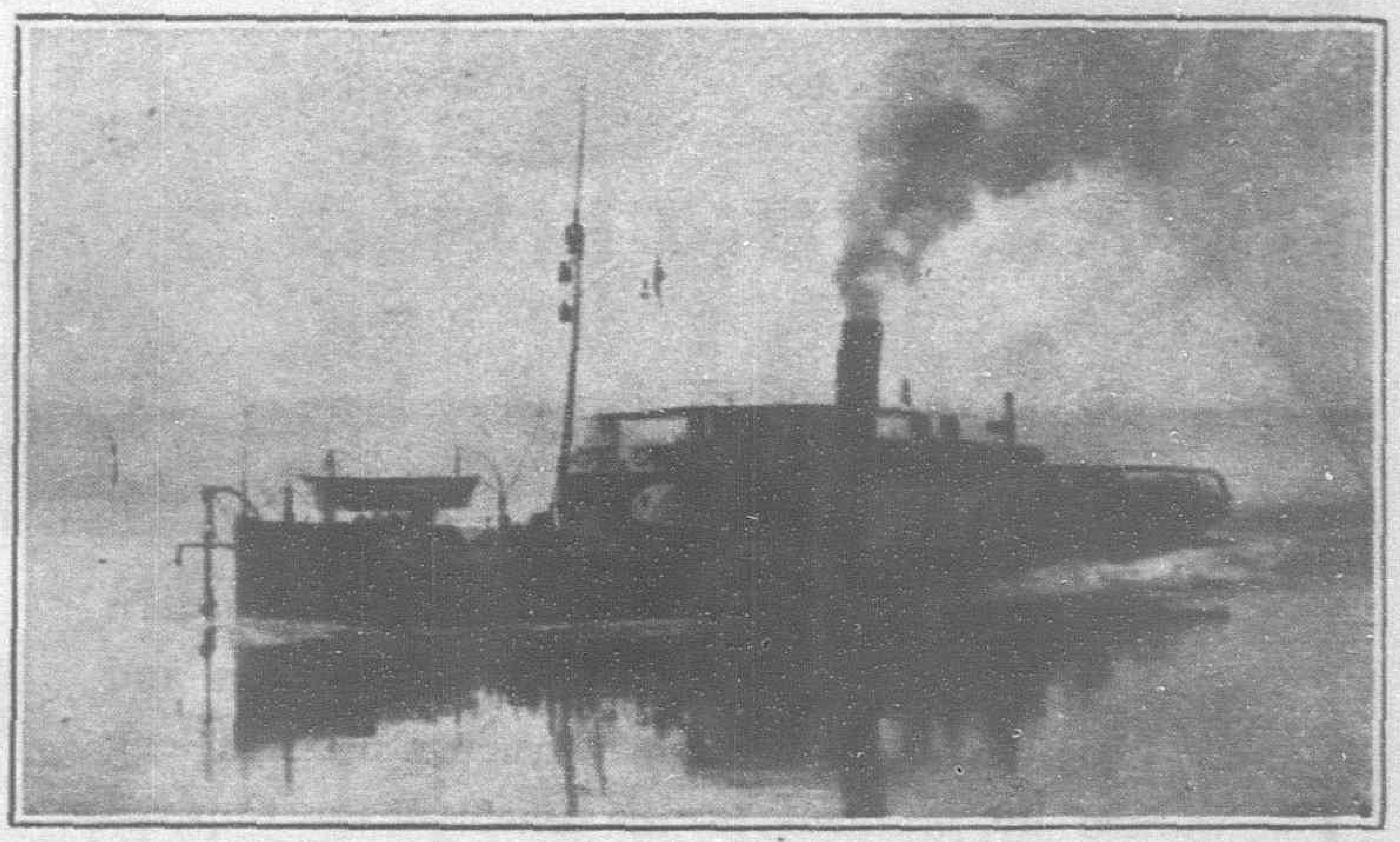
Another reason why cars are short is that many of them are standing on sidetracks and being used as houses. These are near Chita. There are many more at other places particularly at Grodekovo, where they have served as barracks for Kappelists and Semenov troops.



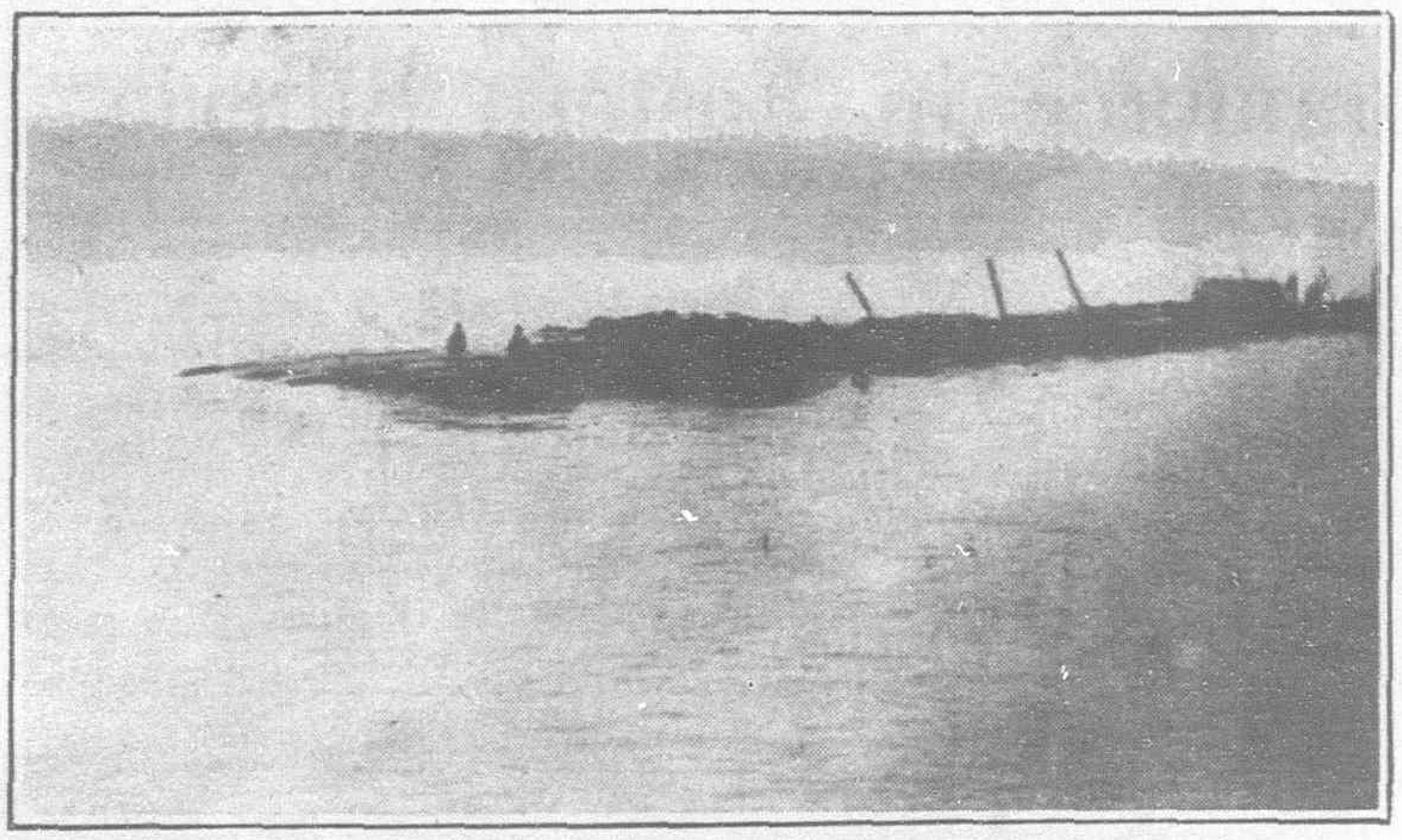
Destruction was not confined to bridges, but thousands of cars were wholly destroyed or rendered useless. This is an armored car of the Semenov troops. A six-inch wall of concrete was built inside the regular walls of the car. It was destroyed in an attack by the Siberians.



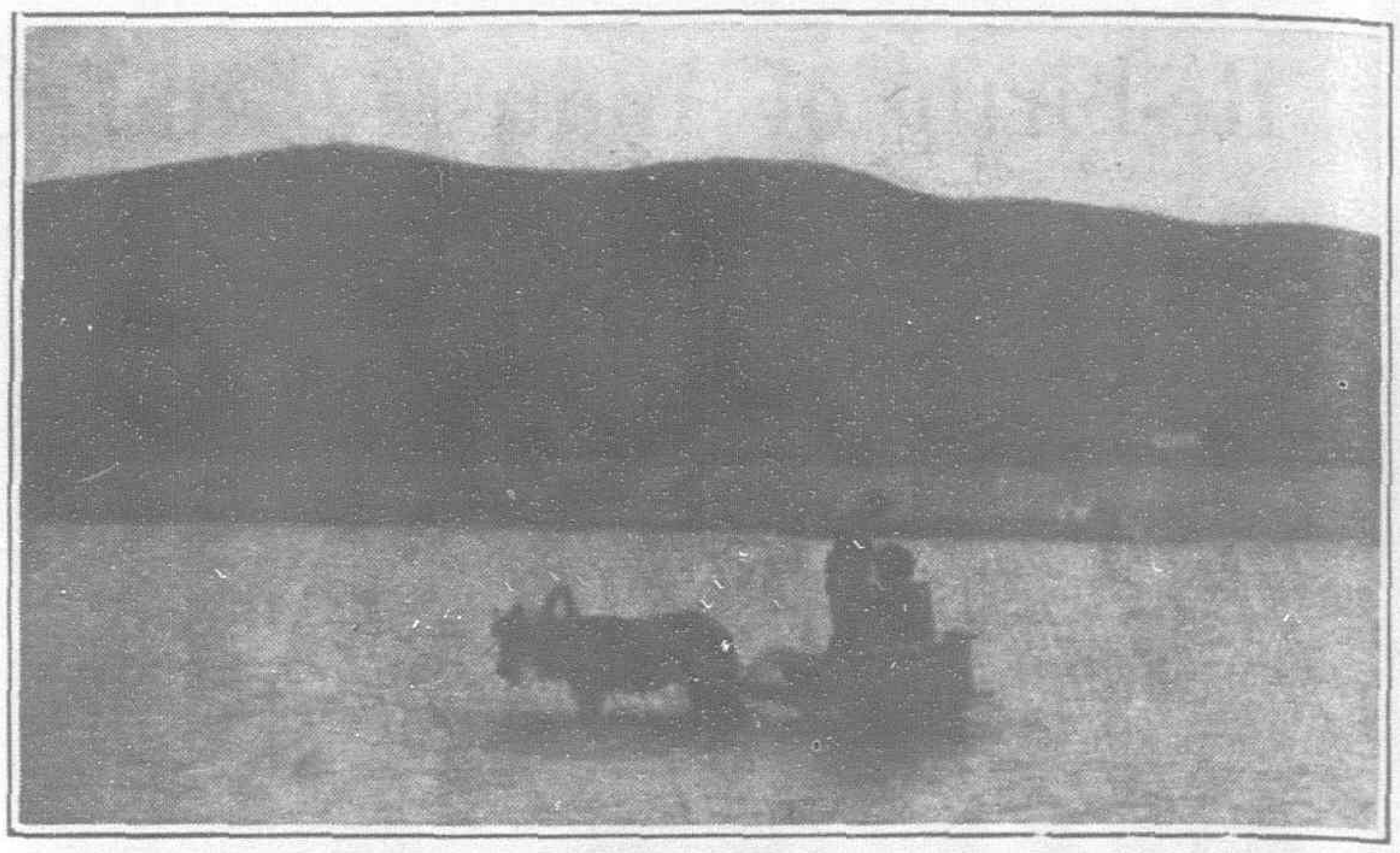
Freight is handled on the rivers in huge barges. Their great beam and shallow draft render them less liable to delay by grounding on the shifting sands of the river bottoms. A single barge can carry a tremendous load.



Barges are drawn, sometimes in strings of two or three, by powerful, side-wheel, shallow-draft tugboats. The fuel used is wood and, as the tugs are all engine, they consume a vast quantity in a day's work.

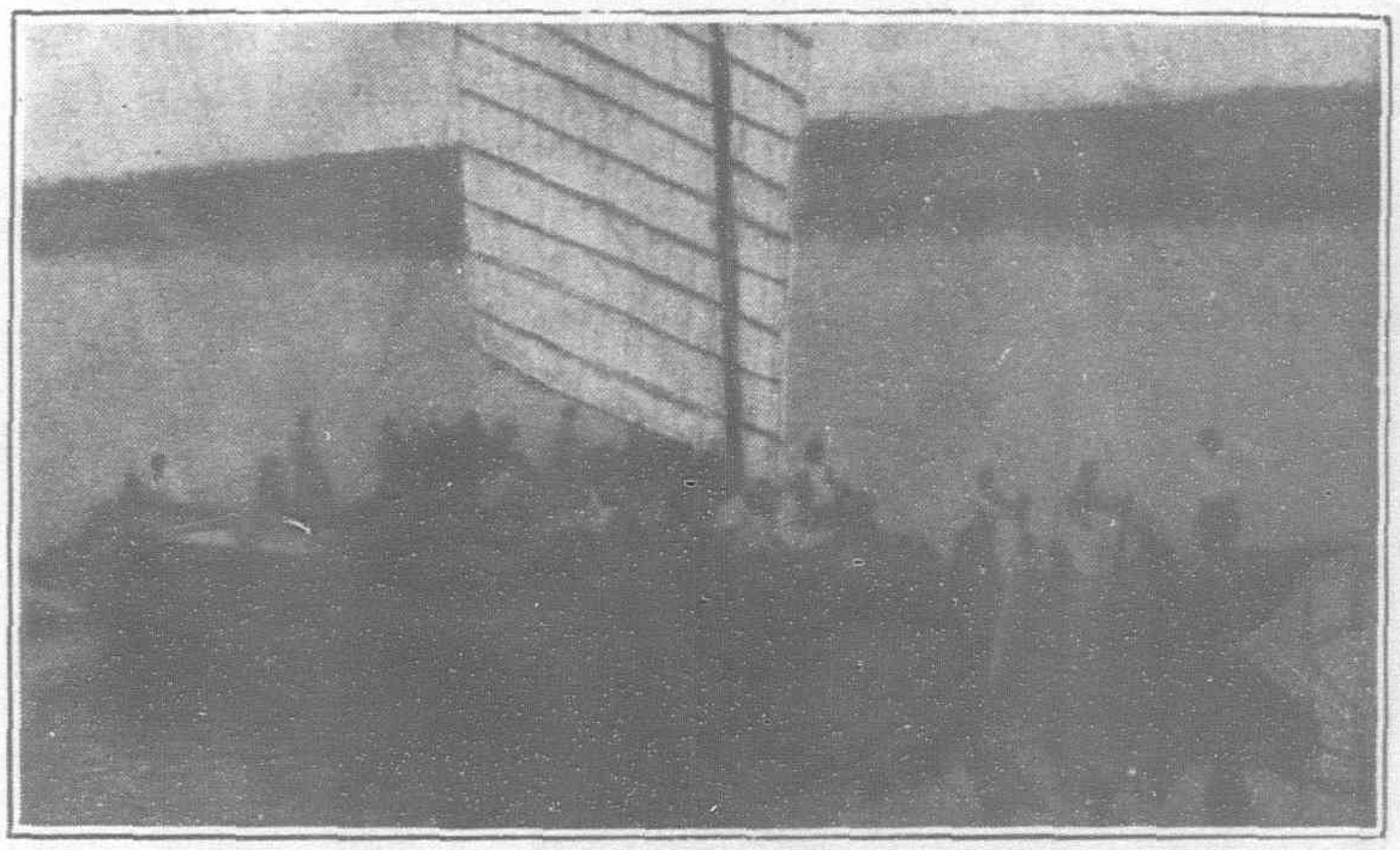


Another type of craft uses cheaper fuel. The huge timber rafts float down the stream, controlled only by the long sweeps which are set both fore and aft. Their crews are mixed Russian and Chinese and live in small huts on the rafts for weeks at a time. Some of them are even provided with horses or cows.



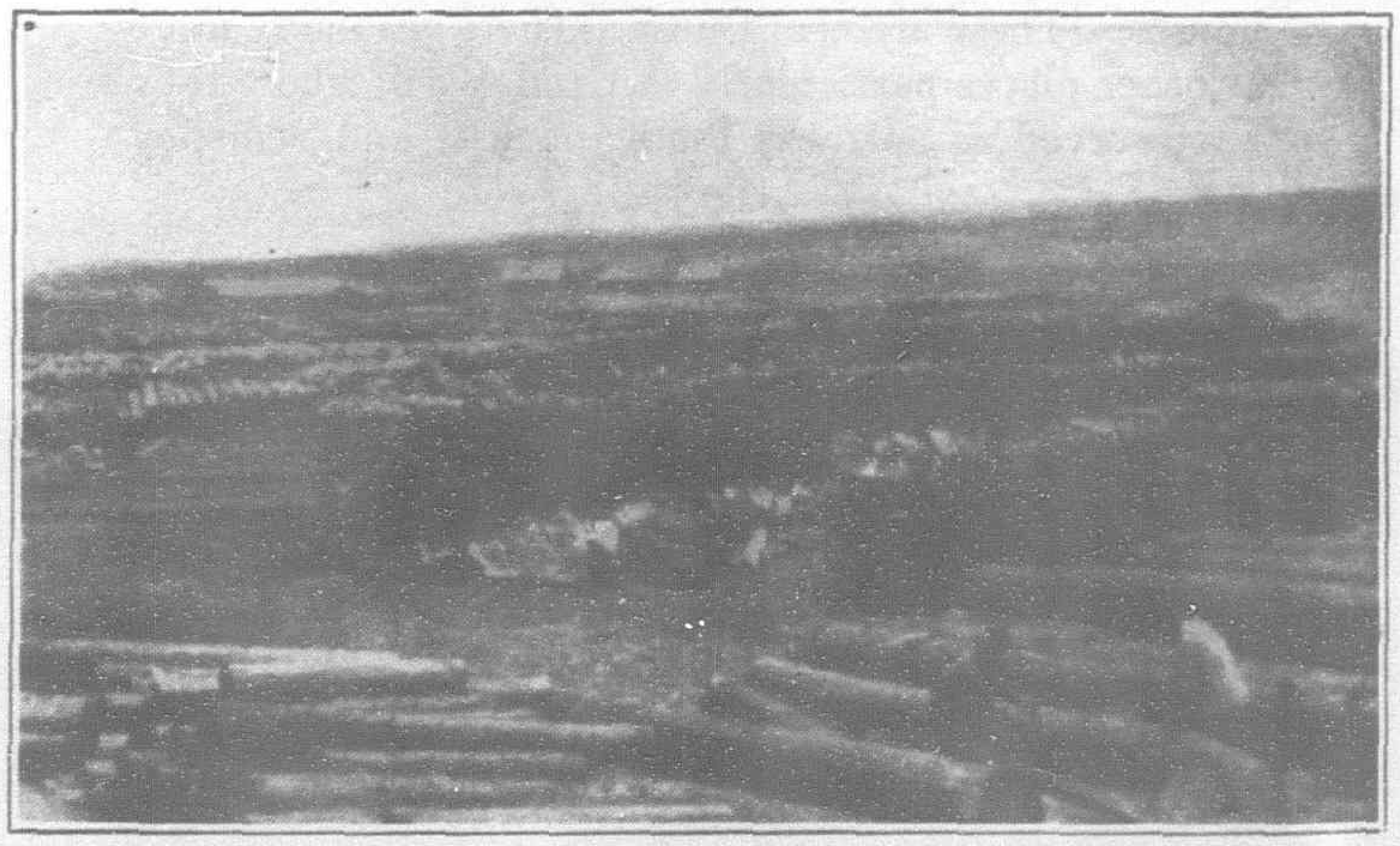
The city waterworks of Stretensk consists of a large number of these carts. They drive into the river, the barrel is refilled, and house to house delivery is made. Running water, in a Siberian city, means a steam pipe alongside of every water-pipe to keep it from freezing for seven months of the year.

The big Russian passenger steamers tie up along the water-front at Habarovsk at the junction of the Amur and Ussuri rivers. Habarovsk is beautifully located on a high bluff overlooking the confluence of the two rivers.

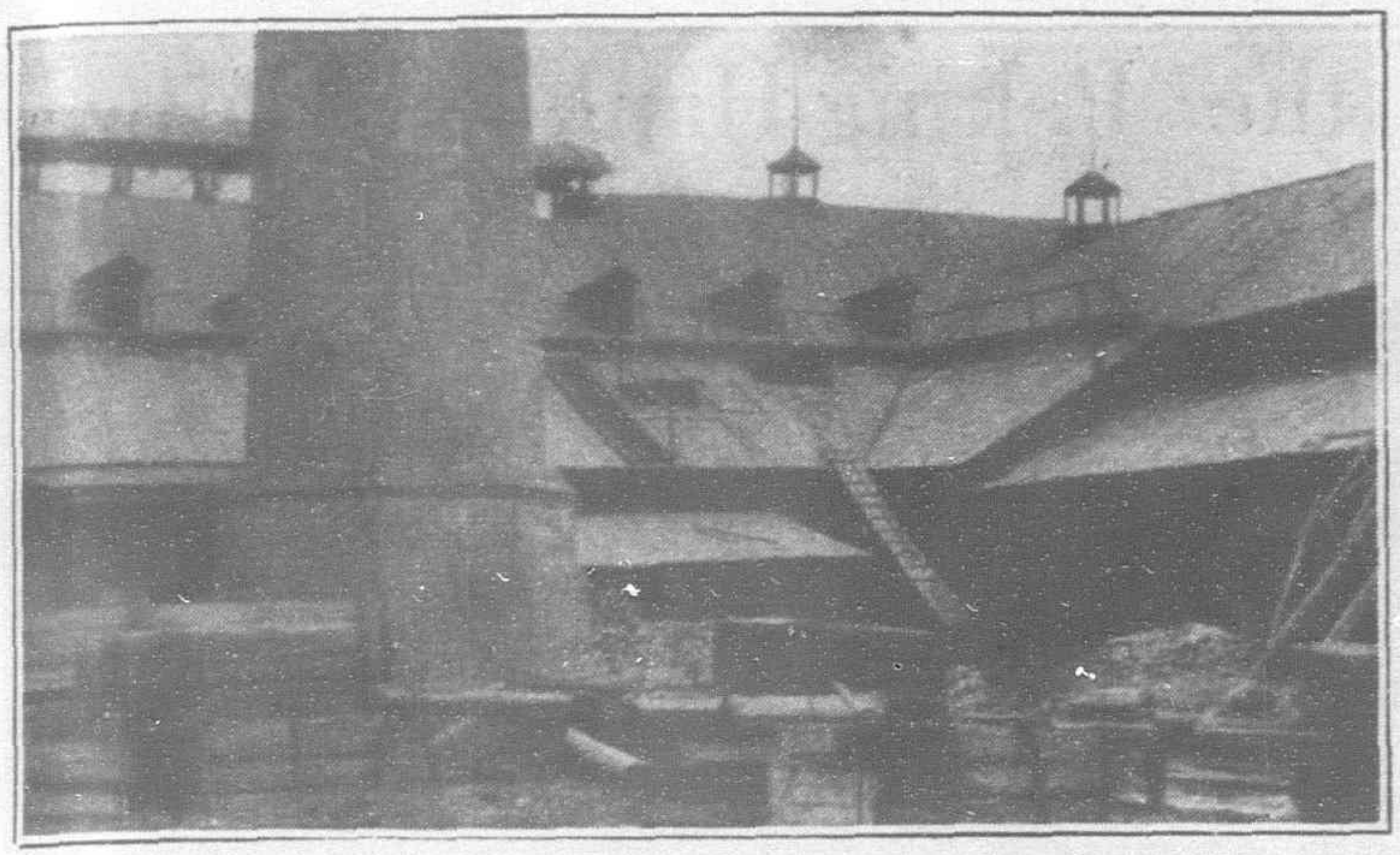


Another freight carrier frequently seen on the Amur River is the Chinese junk. Opposite every Russian settlement is a Chinese village and there is a constant exchange of products between them.

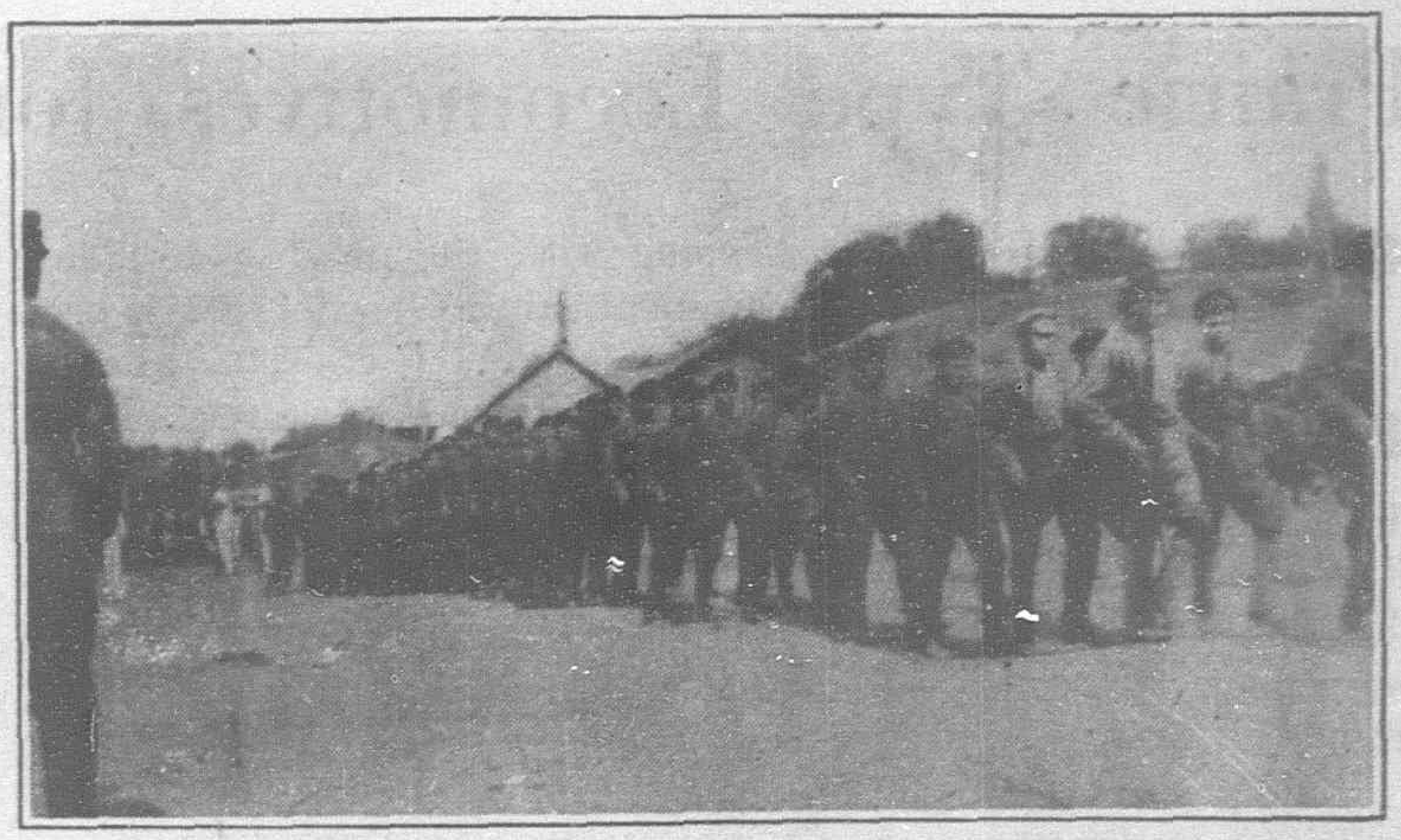
The most famous iron-works in the Far Eastern Republic is Petrovskoe-Zavod, between Chita and Verkhne-Udinsk. It was constructed by, and long worked by, prisoners, for the benefit of the Imperial purse. It was shut down during the war, but has been re-opened by the Trans-Baikal Co-operative Society, which is making many improvements.



The greatest drawback to industry at Petrovskoe-Zavod as well as at other plants demanding a high fuel consumption is the lack of coal. There is not enough coal being produced now to fully meet the railroad requirements and other industries must use wood. The only smelting coal in the territory of the Republic is in the Maritime Province and is now in the hands of the Japanese. This is the woodpile of a Siberian factory. It covers 6 or 8 acres.

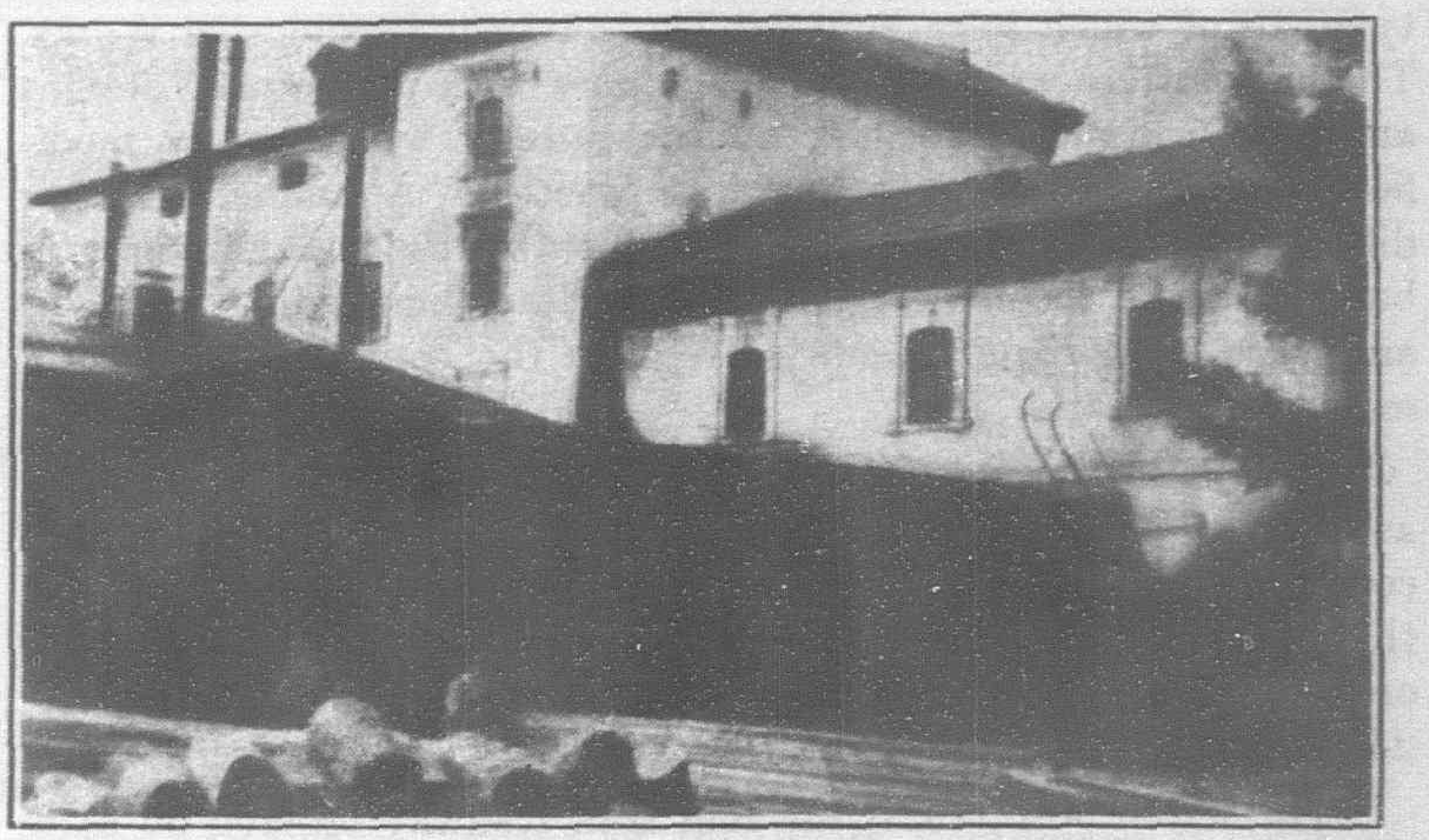


In spite of this handicap, the Co-operative Societies have renewed production in the glass works at Verkhne-Udinsk and the output is nearly as large as before the war. Window-glass, tableware, bottles and all sorts of containers are made here.



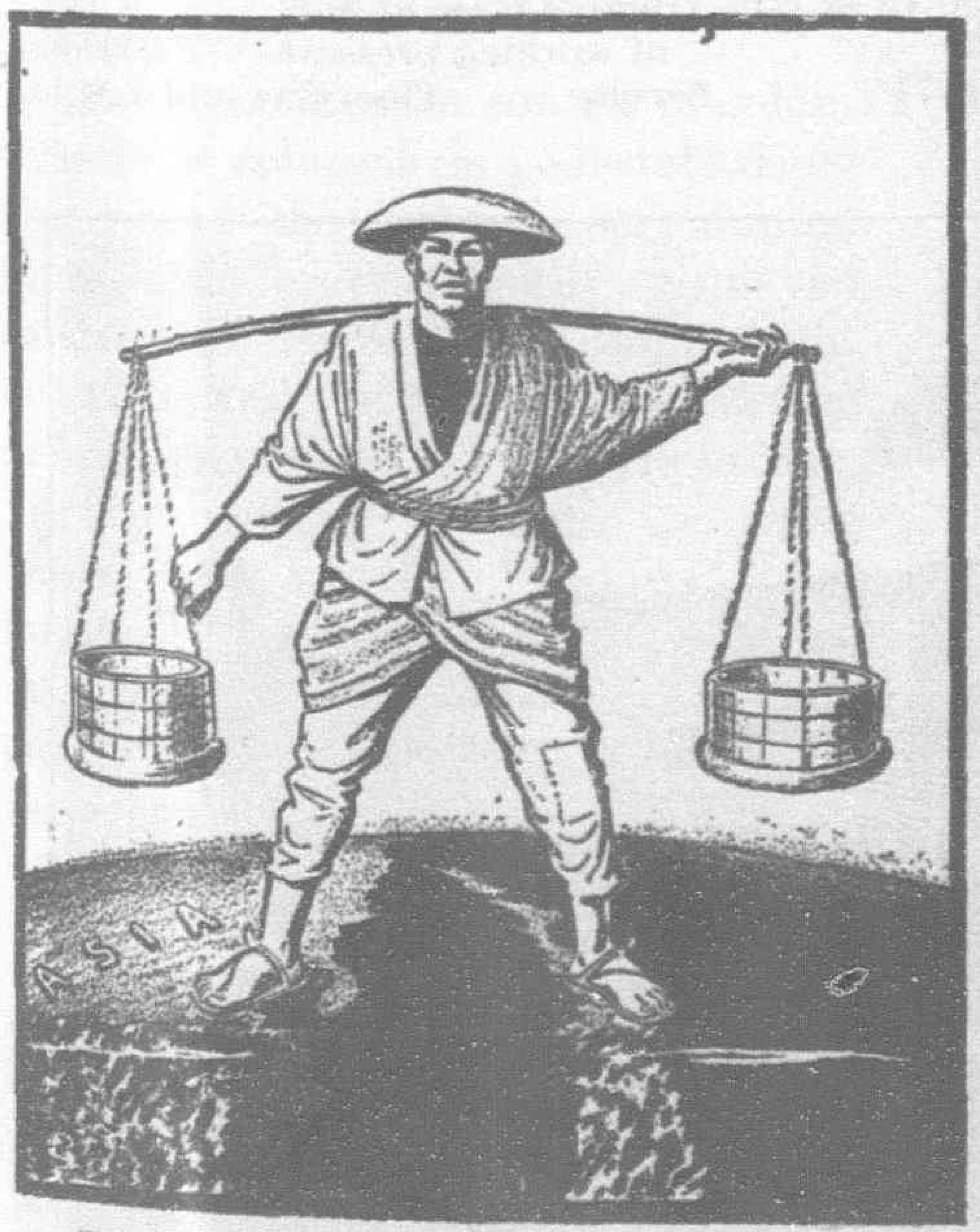
The necessity of keeping a large standing army under arms to defend the country against further raids by the bands of Ungern or Semenov has delayed the re-establishment of industry. This is a company of the Peoples' Army.

Trade, too, is making its re-beginnings on a small scale. There is no "Big Business" in eastern Siberia as yet. The peri-patetic Chinese merchant is the chief operator. He is bringing to the Siberians and selling in the bazaars, of which there is one in every city, the piece goods and small manufactured articles they so sorely need.

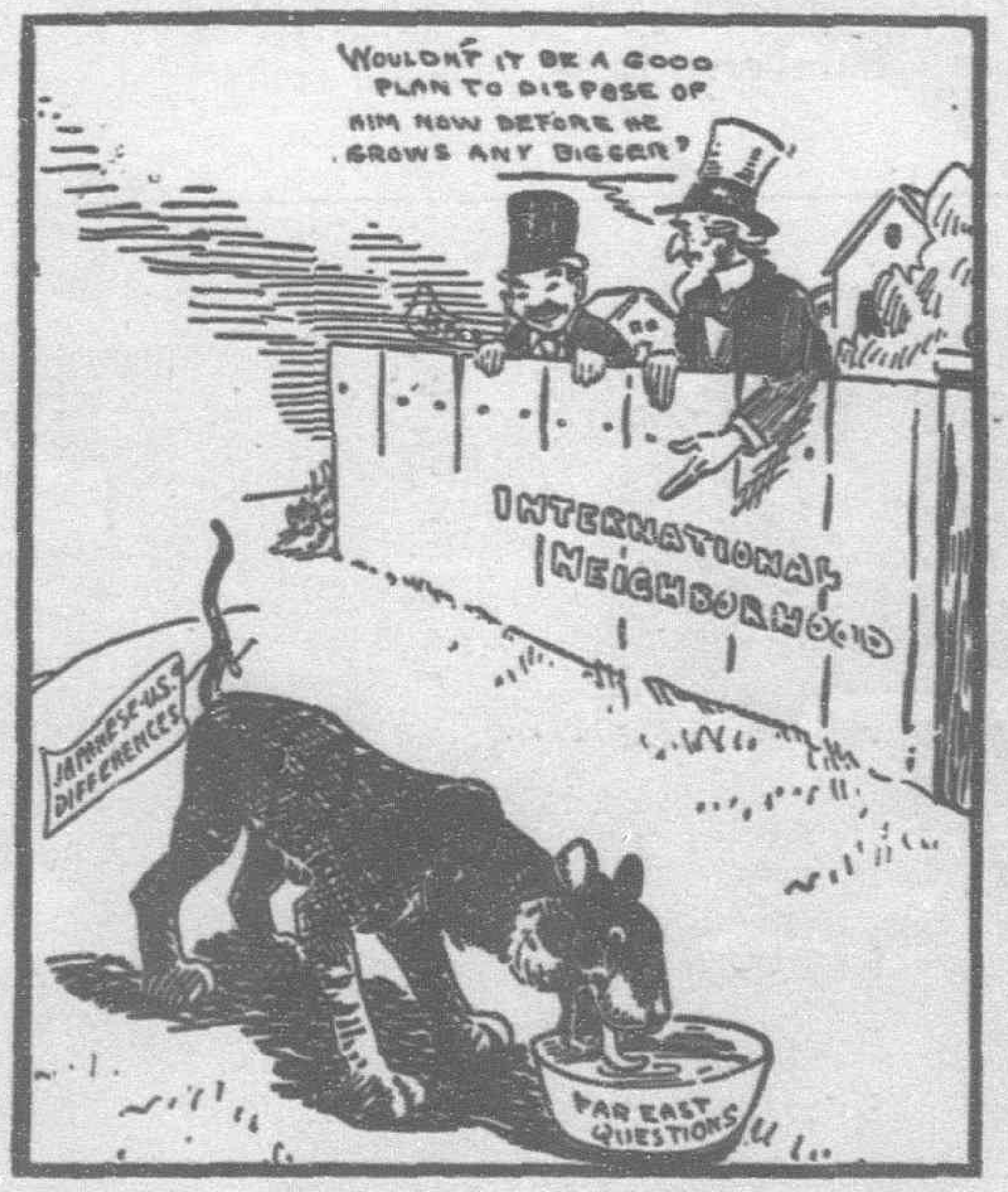


Necessarily the first shops to begin work after the civil war were the railway repair shops. The large shops at Chita and Habarovsk are now running and slowly repairing the destruction done to the roads. That is, when they are not turned aside to make armored trains or repair field-guns for the army.

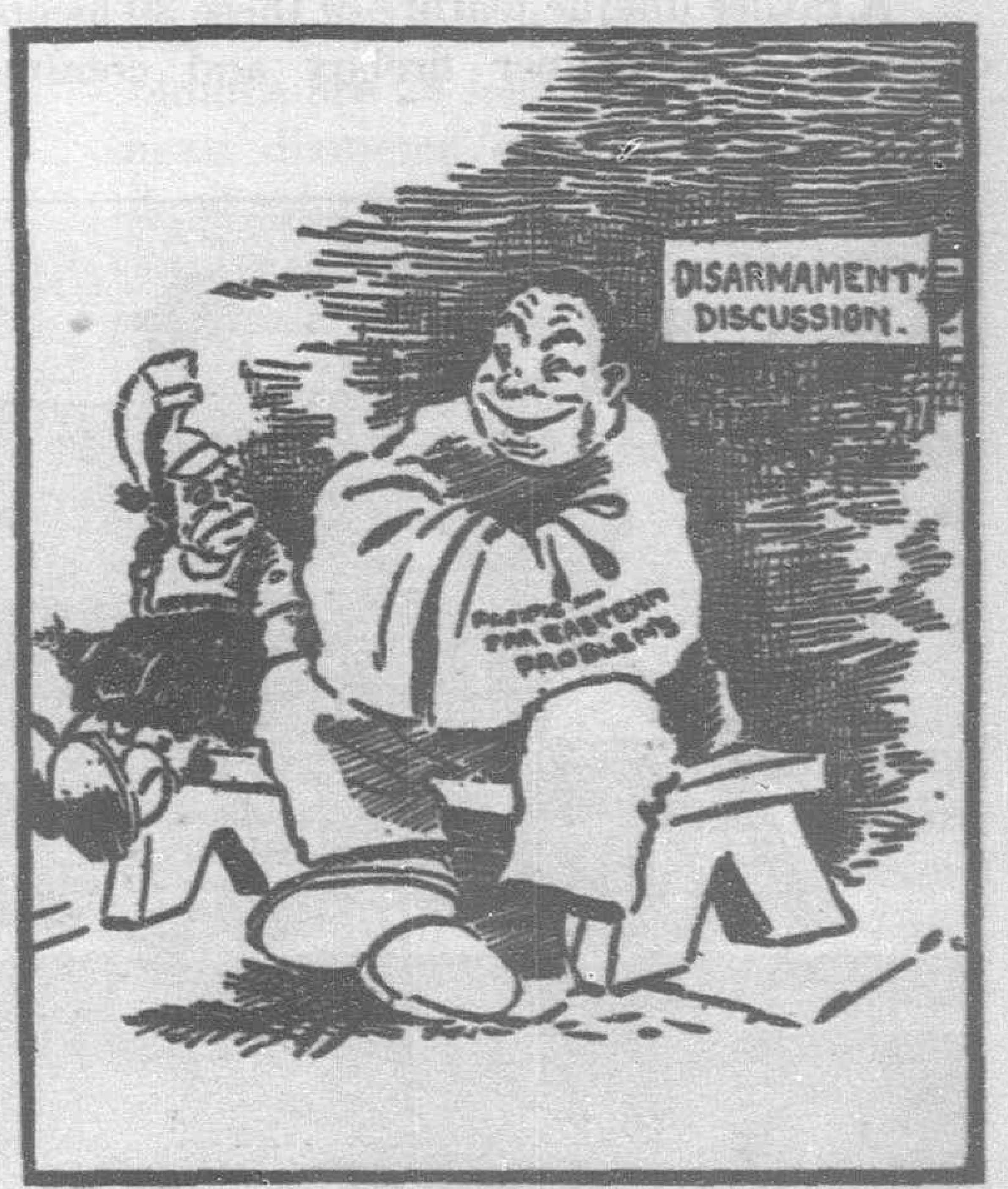
CONFERENCE CARTOONS



THE COLOSSUS OF THE EAST MUST HAVE STANDING ROOM
By Knott, in the *News* (Dallas, Texas)


WOULDN'T IT BE A GOOD PLAN TO DISPOSE OF HIM NOW BEFORE HE GROWS ANY BIGGER?
INTERNATIONAL NEIGHBORHOOD
JAPANESE-U.S. DIFFERENCES
FAR EAST QUESTIONS

WHY NOT DISPOSE OF HIM NOW, BEFORE HE GROWS BIGGER?
By Perry, in the *Oregonian* (Portland, Ore.)



WILL HE CROWD "ARMAMENT" OFF THE BENCH?
By Henry, in the *News-Press* (St. Joseph, Mo.)

Prairie Type Locomotives for the Peking-Hankow Railway

DURING 1921, in keeping with the progressive policy of the Chinese government railways orders have been placed for more than 120 locomotives. This number is probably equal to, or more than, the number that had been purchased in any two previous years in China's history. Of this number the Kin Han Railway will receive 60 prairie type locomotives, 30 of which were ordered direct from The Baldwin Locomotive Works, the balance from the Societe Belge pour l'Exportation Industrielle through the Chinese banking group.

The prairie type of locomotive (2-6-2) was first evolved in the United States for use by the Chicago Burlington & Quincy railroad in 1900 and was used for hauling live-stock quickly across the great prairies in the western part of the country. It has a two-wheel front truck, six coupled driving wheels and a two-wheel trailing truck and is a natural development from the Mogul (2-6-0) type.

In 1919 the Kin Han Railway ordered 30 locomotives of this type, 10 of which were built by The Baldwin Locomotive Works. The locomotives were built in accordance with preliminary designs and specifications furnished by the railway with certain modifications which conform to American practice. A number of rather difficult problems were successfully met by the manufacturer in building these locomotives, including close limitations of weight and very rigid requirements as regards the counter-balancing of reciprocating parts.

The limitations of weight made it necessary to design all parts as light as possible, consistent with the desired strength and, to conform to the railway's specification, only about 46 per cent. of the reciprocating weights were balanced in the driving wheels, in order to keep the dynamic augment or increase in rail pressure, down to 15 per cent. of the static load at 60 kilometres per hour.

On March 30th, 1921, the Kin Han Railway ordered 30 more prairie type locomotives from the Baldwin Locomotive Works. The terms of the contract stipulated that 15 of the locomotives were to be delivered in China in 5½ months and the balance in 6½ months after the signing of the contract. These locomotives were completed and the entire 30 shipped from America on June 11th, 1921, arrived in China and were on the railway wharf near Hankow on September 4th, just five months and five days after the contract was signed, and on November 4th the entire 30 had been re-erected at the railway's shops at Kilometre 10, near Hankow.

A rather unique feature of these 30 locomotives is that they are equipped with copper firebox and combustion chamber. It is believed that these are the first locomotives so equipped, but we would be pleased to hear from our readers on this point if it appears to be incorrect.

Other features of the locomotives include American type bar frames, superheaters, Walschaerts valve gear, Westinghouse air brakes and steam heat Nathan simplex injectors, Nathan five-feed lubricators, Coale safety valves, 18-in. round case headlights fitted with Pyle national incandescent electric equipment, Janney M.C.B. automatic couplers and Haessler speed recorders.

The specifications for the locomotives which are being used equally well for passenger or freight service are as follows:

Gauge	4′ 8½″
Cylinders	20″ x 26″
Valves	Piston 10″ dia.

BOILER

Type	Conical
Diameter	60″
Thickness of barrel sheets...	9/16″ & ⅝″
Working pressure	170-lbs.
Fuel	Semi-Bitum. coal

FIREBOX

Material	Copper
Staying	Radial
Length	83⅞″
Width	54″
Depth, front	67½″
Depth, back...	54″

WATER SPACE

Front	4″
Sides	3″
Back	3½″

TUBES

Diameter 5⅜″	2″
Material, Steel... ...	Steel
Thickness No. 9 W.G.	No. 12 W.G.
Number 21	130
Length 14′ 7½″... ...	14′ 7½″

HEATING SURFACE

Firebox	127 sq. ft.
Combustion chamber	56 sq. ft.
Tubes	990 sq. ft.
Flues	430 sq. ft.
Fire brick tubes ...	15 sq. ft.
Total	1,618 sq. ft.
Superheater	371 sq. ft.
Grate area	31.5 sq. ft.

DRIVING WHEELS

Diameter, outside ...	59″
Diameter, centre ...	53½″
Journals, main ...	8½″ x 11″
Journals, others ...	8½″ x 11″

ENGINE TRUCK WHEELS

Diameter, front ...	33½″
Journals	6″ x 12″
Diameter, back ...	39⅜″
Journals	7″ x 12″

WHEEL BASE

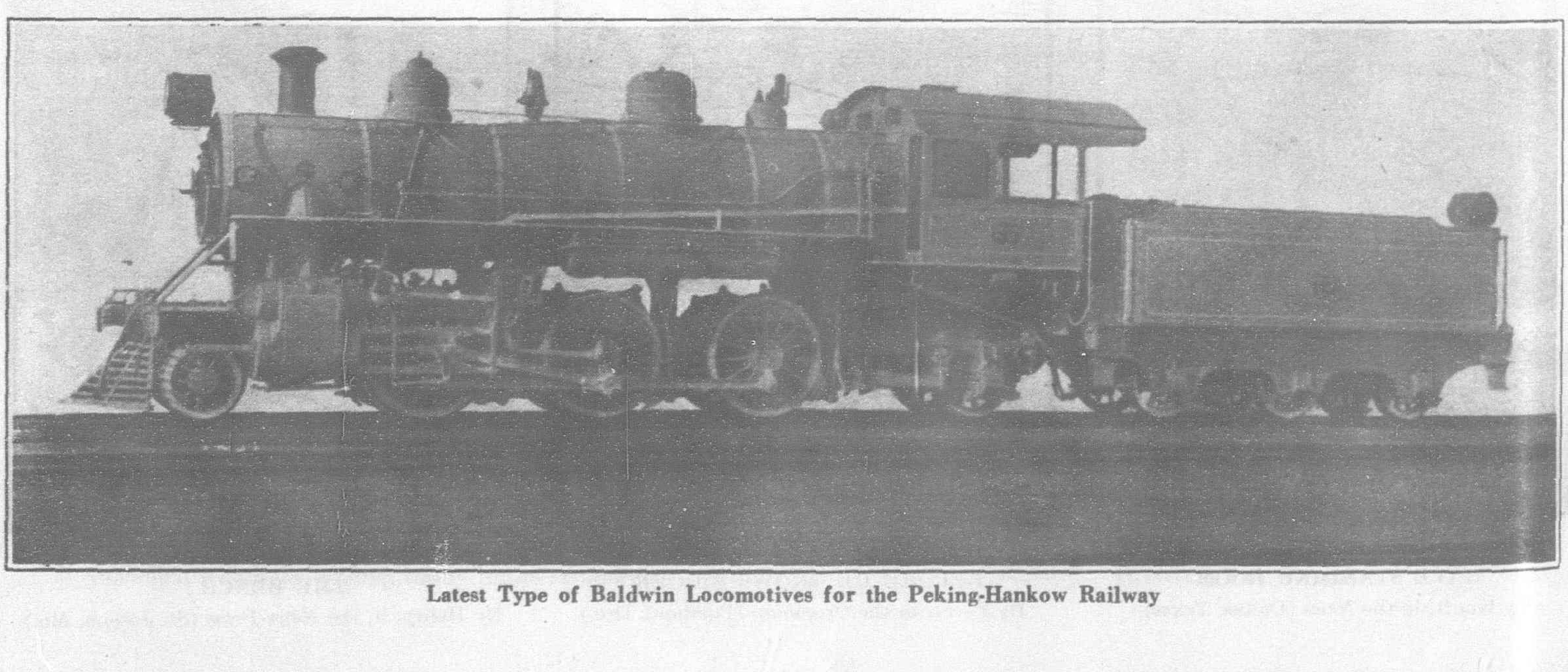
Driving	13′ 10″
Rigid	13′ 10″
Total engine	31′ 7″
Total engine and tender	53′ 10¼″

WEIGHT

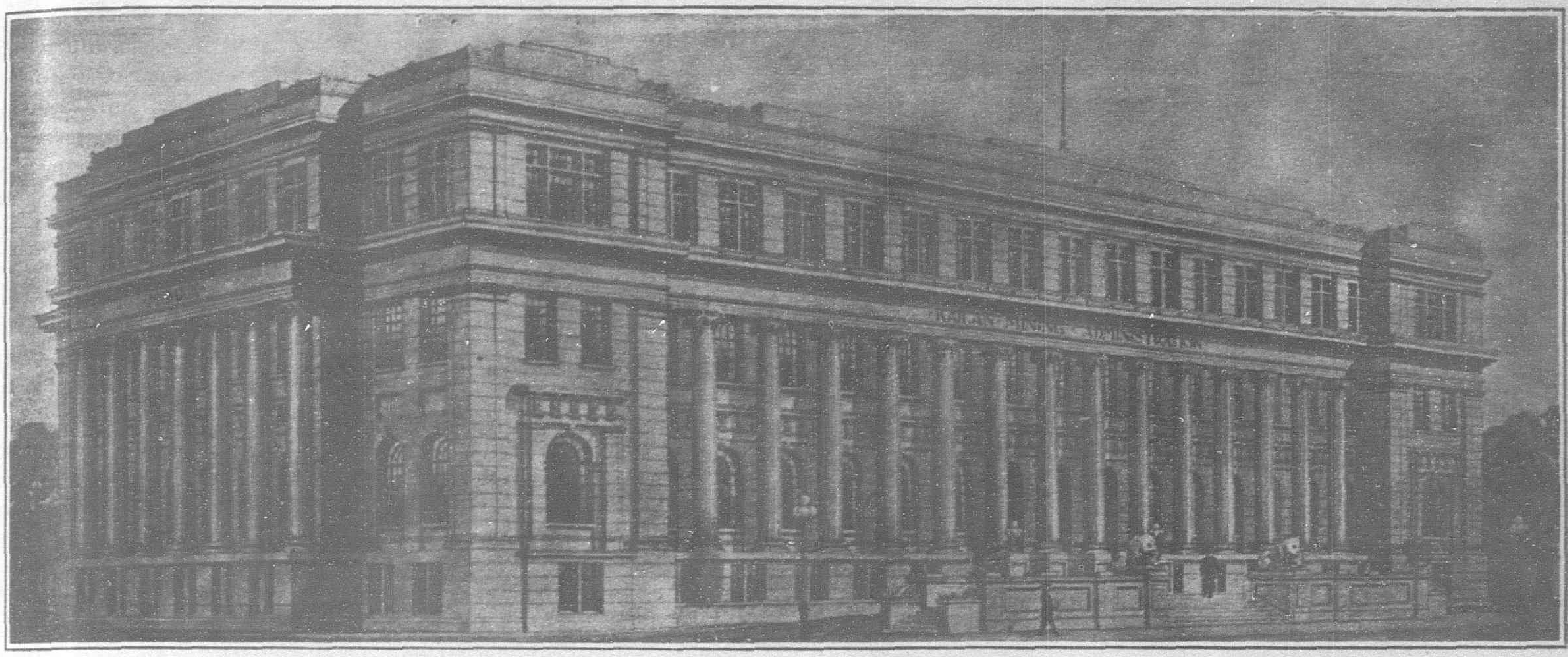
On driving wheels ...	99,000-lbs.
On truck, front ...	25,000 ,,
On truck, back ...	31,000 ,,
Total engine	155,000 ,,
Total engine and tender	247,500 ,,

TENDER

Wheels, number	6″
Wheels, diameter	39⅜″
Journals	5.11″ x 10.23″
Tank capacity	4,800 U.S. gals.
Fuel	7 tons
Tractive force at 85% of working pressure	25,500-lbs.
Service ...	Passenger and Freight.



Latest Type of Baldwin Locomotives for the Peking-Hankow Railway



New Kailan Administration Building at Tientsin

The New Kailan Building

THE new headquarters of the Kailan Mining Administration at Tientsin now nearing completion, is one of the finest examples of foreign architecture in China. It was designed by Mr. B. C. G. Burnett, the Tientsin representative of the well-known firm of Atkinson & Dallas, Ltd., in competition with several other architects. The contract for the erection has been carried out by Mr. Hong Mowkee, a prominent Chinese builder of Shanghai who has had special experience in the use of artificial stone such as is used for all the face work of the new structure.

The new offices form a rectangular pile 220 feet long and 120 feet deep with four stories aggregating some 70 feet in height, faced in artificial grey granite.

Mr. Burnett has adopted the Neo-classic style, and indicates Roman influence in the treatment of the main floor windows but, in the final plans, this has been eliminated by the adoption of square, mullioned openings, leaving the style throughout purly Grecian.

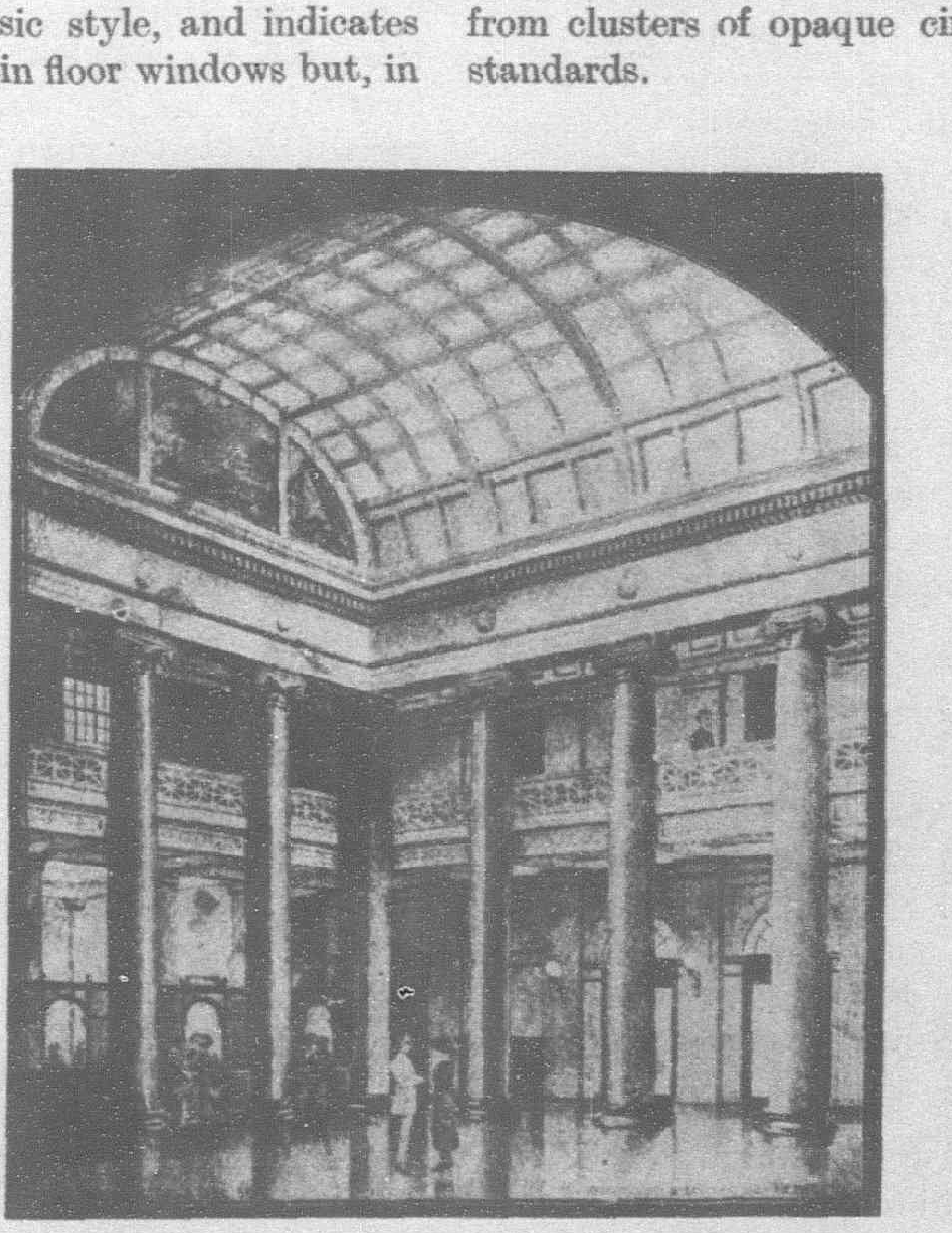
The main facades consist of colonnades Ionic columns on pedestals rising clear above the terrace, surmounted by an attic order. Boldly displayed on the main frieze is the administration's title and the year of construction in Roman numerals fashioned in bronze. The main entrance occupies the three central bays of the Meadows Road frontage and is approached by a broad easy flight of the steps in natural granite which lead to the vestibule through treble swing doors.

The Basement

The basement stands practically at the level of the adjacent public roadways and is waterproofed to a degree calculated to withstand any possible water pressure. It will provide accommodation for the British post-office, the entry for which is on the west front; for a chemical laboratory; the heating and hot water installations; record rooms as well as foreign and native kitchens.

Main Floor

The most striking feature of the main floor is the large galleried court occupying the centre of the building, and giving access to the principal offices, the grand marble staircase, elevators, the public counters, etc. The lighting of this court is obtained through a semi-circular dome fitted with leaded lights in which pale amber color predominates, relieved here and there with patches of sky blue and red. At night, electric lamps will diffuse light above the stained glass while the floor of the court will be amply illuminated from bracket lamps forming the lighting scheme of the corridors and from clusters of opaque circular globes supported by four bronze standards.



Main Hall of the New Kailan Building

Rising from a Mosaic tiled floor, and supporting the central dome, are sixteen columns of polished Tsingtao granite in a rich shade of red. These columns are 28 feet in height and of a mean diameter of three feet. Additional color is lent to the interior decoration by paintings typical of the administration's activities, which will fill the panels of the vertical walls of the dome.

Massive panelling in stone finished plaster constitute the general treatment of the interior walls conforming, in a modified degree, to the classic style of the exterior.

The managerial suite of rooms, connected by the private corridor, occupy the whole of the eastern front and are fitted throughout with hardwood parquetry flooring and massive oak panelling. Lamps concealed in the cornices will diffuse light to these apartments.

The board room, a spacious apartment of dimensions 50 by 30 feet, is partially panelled in fumed oak and the walls are formed into a series of recesses by detached oak columns supporting the coffered ceiling.

Other portions of the main floor are taken up by the extensive coal selling and shipping business, and the various administrative offices requiring proximity to the direction, while the public counters, on pedestals of grey marble, extend into and occupy the western end of the central court.

The height of all enclosed apartments on this floor is eighteen feet.

The second floor provides ample accommodation for the Chinese and the accounting departments the rooms of the principal Chinese officials of the administration being finished in parquetry flooring, oak panelling and with concealed lighting effects.

The third floor affords accommodation for other subsidiary departments and leaves a substantial reserve for extensions in the future.

All the floors and the very extensive flat roof are connected by two electrically-driven six-passenger elevators. The hot water heating is from a two-unit installation deriving its power from small boilers of the Lancashire type: the treatment of sewerage by the modern septic process; the expulsion of all waste water and sewerage by pressure through a metal pipe communicating with the river and the use of the most modern appliances for ventilation, signalling and electric lighting.

The total estimated cost of the construction of the head offices is approximately half a million dollars, exclusive of the value of the land.

International Finance and Exchange, Inc.

A FORMAL announcement of international interest appeared recently in the *Manshu Nichinichi Shimbun* concerning the establishment of the International Finance and Exchange, Inc.

According to the articles of association, as registered with the American Shanghai court, exchanges necessary for dealing in merchandise, share stocks and currencies, in China and the other parts of the Far East may be founded. Transportation by railways, the construction of roads, canals, waterworks, telegraphs and telephones in China, Manchuria and Mongolia may be undertaken. Mining, fishery, agricultural, forestry and manufacturing industries, too, in the same regions are to be taken up. In addition, the installation of blast furnaces, electricity and other motor power, lighting services, wet docks, wharves and elevators of all kinds, and the erection of hotels and warehouses, with their management, and trading, etc., are to be undertaken as financiers. Banking business, issue of debentures, guarantee of payment, guaranty and trust business, exploiting of special privileges, etc., are also included in the new Company's sphere of operation.

OFFICIALS: On the management are mentioned the following names:—

Mr. Edwin W. Mills (American), organizer; Mr. S. Hayakawa (president, S.M.R. Co.), controller; Mr. T. Murano (president, *Manshu Nichinichi Shimbun*), chairman, committee for opening business; Messrs. Ohi, Namba, Sugino and Soyejima (standing committee); Messrs. Minami, Koike, Kanda, G. Mochizuki, Tokuda, Iwai, Mayeda, Kataoka, Takase and over twenty others (on the committee).

CHINESE REPRESENTATIVES: Mr. Yang-tu (high adviser to the president of China); Mr. Chou Tzu-chi (ex-minister of finance); Mr. Chang Kuo-chuan (president, administrative litigation court); Gen. Yen Chi-han; Gen. Hsu Shao-chen (chief of general staff of the Canton government); Gen. Lu Kung-wang (ex-military commander of Chekiang; Mr. Wu Tiao-ching (financier of Tientsin); Mr. Tsung Wei-chen (ex-senator); Mr. Cheng Chao-chi (capitalist residing abroad). In addition, some dozen names of note are on the list. It is understood that on the complete establishment of the new Company, a board of directors is to be nominated on the recommendation of Mr. S. Hayakawa (president, South Manchuria Railway Company), who is also the supreme adviser.

AIMS OF NEW CORPORATION: China, in the post-war times, has turned the central market for the world's economic exploitation, where businessmen of all nations are in competition. It would be against the interests of these countries to be carried away by petty jealousies into discord, for such will only convert China into a theatre of commercial warfare. This will impede the future development of China. If the inexhaustible resources dormant in China should be tapped by international co-operation on common capital, the results to be reaped will be immense, to be shared by all countries. Our present effort is to realize this ideal for investment in all kinds of enterprises on a joint management system, and to develop the natural resources of China, to the end of drawing closer the international relations of China, at the same time setting an example of promoting an undertaking of mutual good to the powers.

CAPITAL AND SHARES: The Company's capital was Y.1,000,000, at the start; it has been raised to Y.20,000,000, divided into 1,000,000 shares of Y.20 each. The first quarterly payment of Y.5 per share is to be completed during February, 1922.

PROSPECTUS: To begin with, the new Company is to set up at Tientsin an exchange transacting in gold and silver currencies, merchandise stocks, share stocks, etc. It will besides engage in financing and trust business, accepting stocks as security. The cultivation of cotton, etc., will be also invested in.

The sphere of operation is to be gradually extended to Shanghai, Hankow, Canton and other places that may be deemed desirable.

As to the business returns, even from the exchange and trust business at Tientsin alone, a dividend of more than 20 per cent. to the capital paid up is expected to be distributed.

SPECIAL CHARACTERISTICS OF NEW COMPANY: (1) CURRENCY BUSINESS: To China, a silver standard country, some auxiliary institution is necessary in doing business with gold standard countries, for the purpose of providing beforehand against possible fluctuations of exchange rate. At present, most of business carried on on the currency exchanges of China consists of spot or short-termed business, and there is no adequate medium to cover forward contract deals. The new Company is to fill this need, and offers the facility of concluding long-termed contract deals in terms of the liberal American law.

(2) FLOTATION OF DEBENTURES: In terms of the articles of association, the Company is authorized to issue debentures, and, as occasion demands, low interest capital may be absorbed for investment in ventures of any magnitude.

(3) SPECIAL BUSINESS PRIVILEGES: For the establishment of exchanges at various places in China, the Company has such a concession established in a general way. Therefore, even in case of opening business in any new quarter, no company need be founded separately for the purpose, but a branch or an agency of this Company may be entrusted to set about the work.

The American law imposes but a nominal tax on the business put through, so this is a decided advantage scored over the rival corporations.

HEAD OFFICE: The head office is located at Peking, China. Offices are expected to be opened in French Concession, Tientsin, in the Canton Road, Shanghai, and in the British Concession, Hankow. An office has been opened on Himono-cho, Nihonbashiku, Tokyo.